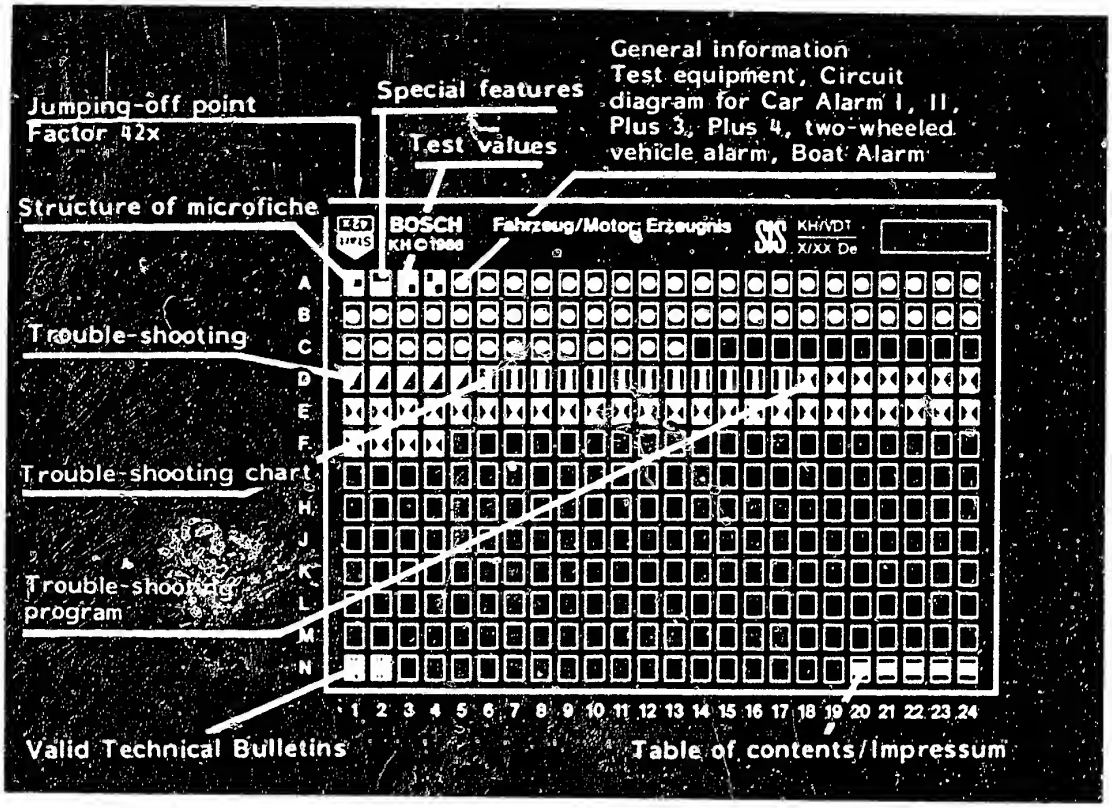
Structure of microfiche



1. Read from left to right

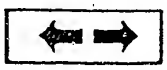
2. Title of microfiche (appears on each coordinate)

E16	Product/component/test step Vehicle/engine

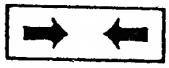
Coordinate

3. Limits of section


Beginning


Mid-section


End


One-page section

4. References to relevant test steps in test specifications; coordinate e.g. C6

C6

1. Special features

Revised test instructions for
Car Alarm I, II
Plus 3 (wheel-protection system),
Plus 4 (passenger-compartment protection)
12 V and 24 V
Two-Wheeled Vehicle Alarm
Boat Alarm

High-voltage arrows on the circuit diagrams mean: Caution, high-voltage, 400 V ... 25 kV.

2. Test specifications

Car Alarm I	
Battery voltage	10 ... 13 V
Priming	25 ... 45 sec.
Alarm time	25 ... 30 sec.
Response time	5 ... 8 sec.
Car Alarm II	
Battery voltage	10 ... 13 V
Voltage between terminal E and vehicle ground	
Alarm switched on	3.2 ... 4.5 V
Alarm switched off	4.8 ... 6.5 V
Priming	immediate
Alarm time	20 ... 30 sec.
Response time	immediate
Car Alarm Plus 3	
Battery voltage	9 ... 13 V
Tilt sensor adjustment time	approx. 45 ... 55 sec.
Response time	approx. 1 ... 2 sec.

Test specifications (continued)

Car Alarm Plus 4	
Battery voltage	10 ... 13 V
Priming with Car Alarm I	25 ... 45 sec.
Priming with Car Alarm II	immediate
Alarm time	20 ... 30 sec.
Response time with Car Alarm I	5 ... 8 sec.
Response time with Car Alarm II	immediate
Two-Wheeled Vehicle Alarm	
Battery voltage	9 ... 13 V
(vehicle electrical system)	
(own battery)	9 V accumulator
Priming	immediate
Alarm time	20 ... 30 sec.
Response time	immediate
Boat Alarm	
Battery voltage	8 ... 13 V
Priming	10 ... 20 sec.
Alarm duration	20 ... 30 sec.
Alarm delay	5 ... 8 sec.

3. Necessary test equipment and tools

Electrics tester	ETE 014.00	0 684 101 400
Stopwatch		commercially available

4. Possible circuit diagrams for Car Alarm I, II, Plus 3, Plus 4, two-wheeled vehicle alarm, Boat Alarm

The circuit diagrams shown on the following Coordinates may be of assistance to the experienced expert when trouble-shooting.

The Coordinates show formerly used circuits and new circuits.

They are arranged in the following order:

Car Alarm I

Car Alarm II, 12 and 24 V

Car Alarm Plus 3 (wheel protection)

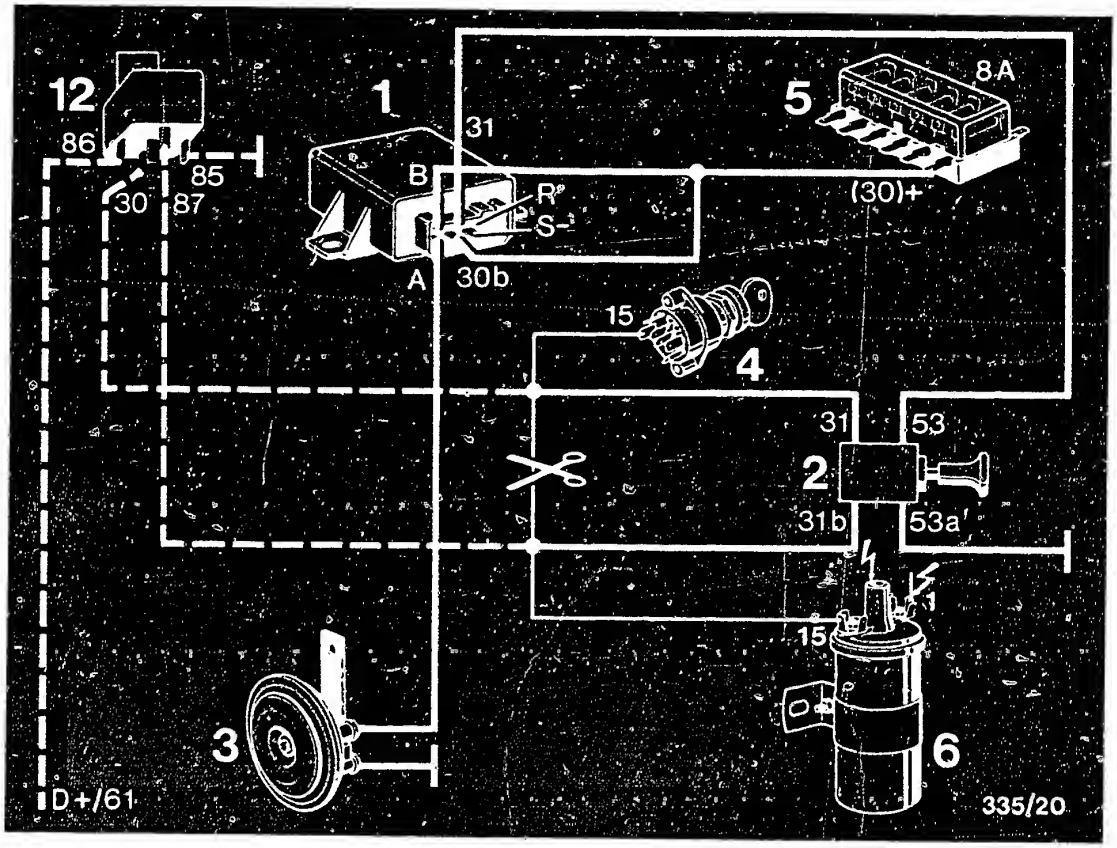
Car Alarm Plus 4 (passenger-compartment protection)

Two-wheeled vehicle alarm

Boat Alarm

Where high-voltage arrows appear on circuit diagrams, e.g. at ignition coils, this means:

C A U T I O N 400 v - 25 Kv!



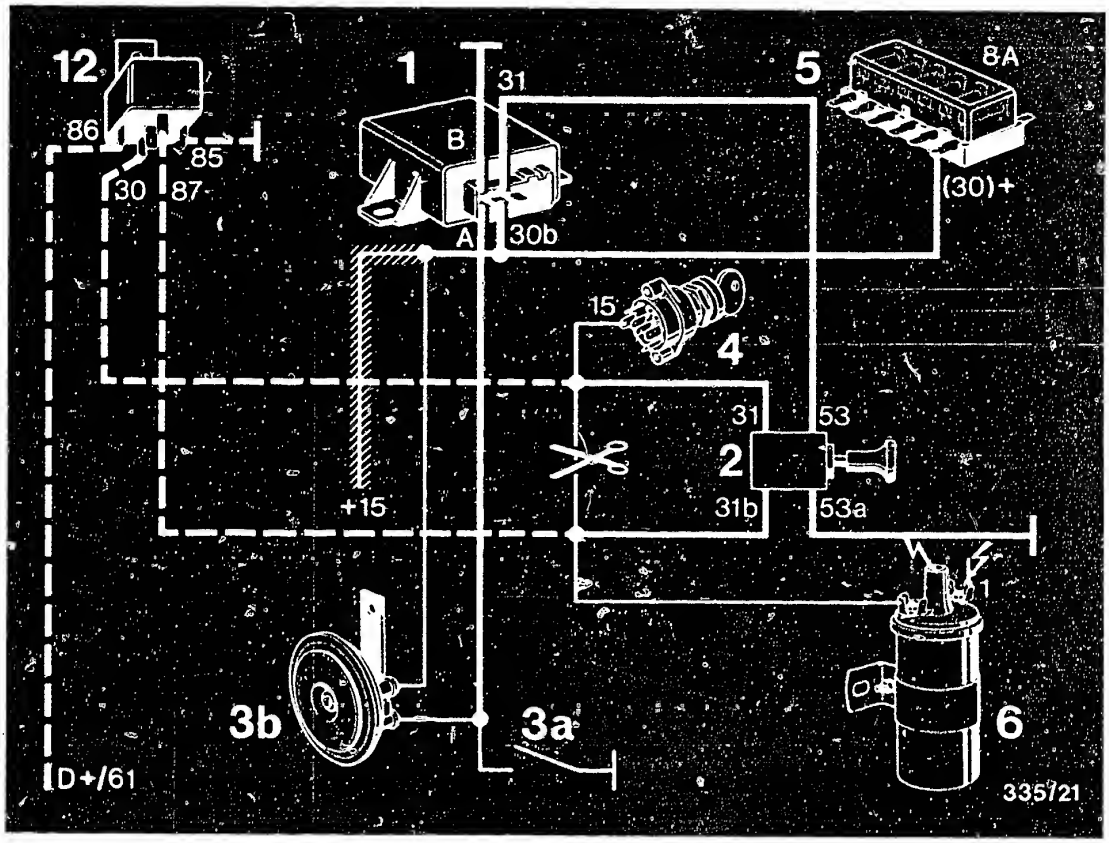
1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V change-over contact, here as normally-open contact)

4.1 Circuit diagrams - Car Alarm I

4.1.1 Basic circuit with ignition immobilization (Car Alarm I) with separate alarm horn

Alarm switch 2 switches "negative" (-) to alarm relay 1.

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

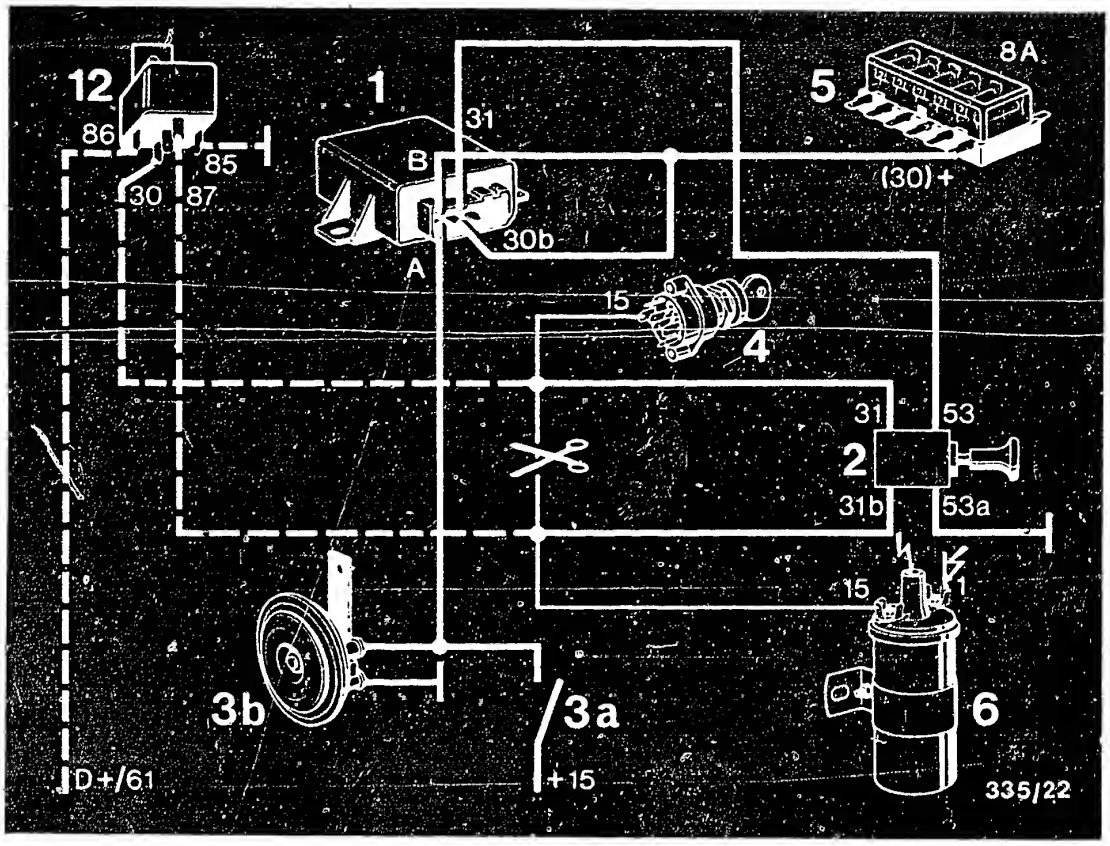


1 = Alarm relay
2 = Alarm switch
3a = Switch for standard horn
3b = Standard horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-open contact)

4.1.2 Basic circuit with ignition immobilization (Car Alarm I) with standard horn

Horn switch switches "negative".
Alarm switch (2) switches "negative" (-) to alarm relay.

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

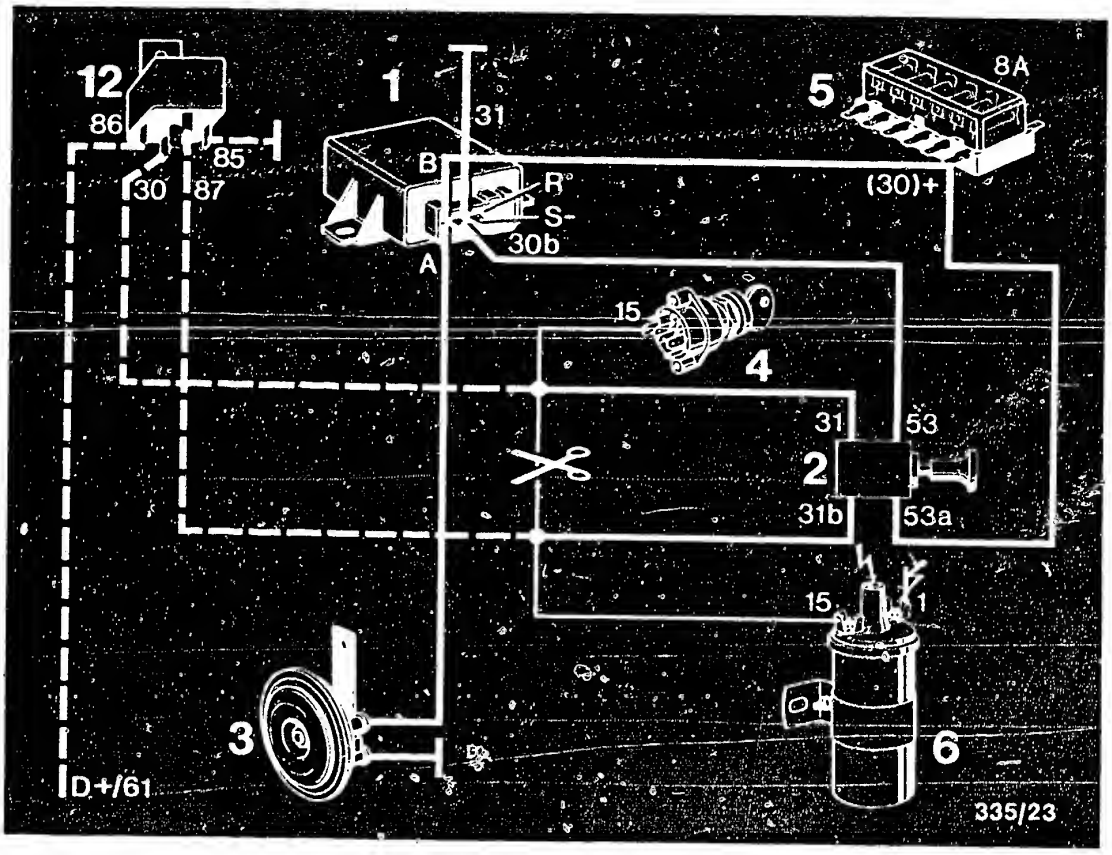


1 = Alarm relay
2 = Alarm switch
3a = Switch for standard horn
3b = Standard horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-open contact).

4.1.3 Basic circuit with ignition immobilization (Car Alarm I) with standard horn

Horn switch switches "positive".
Alarm switch 2 switches "negative" (-) to alarm relay 1.

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

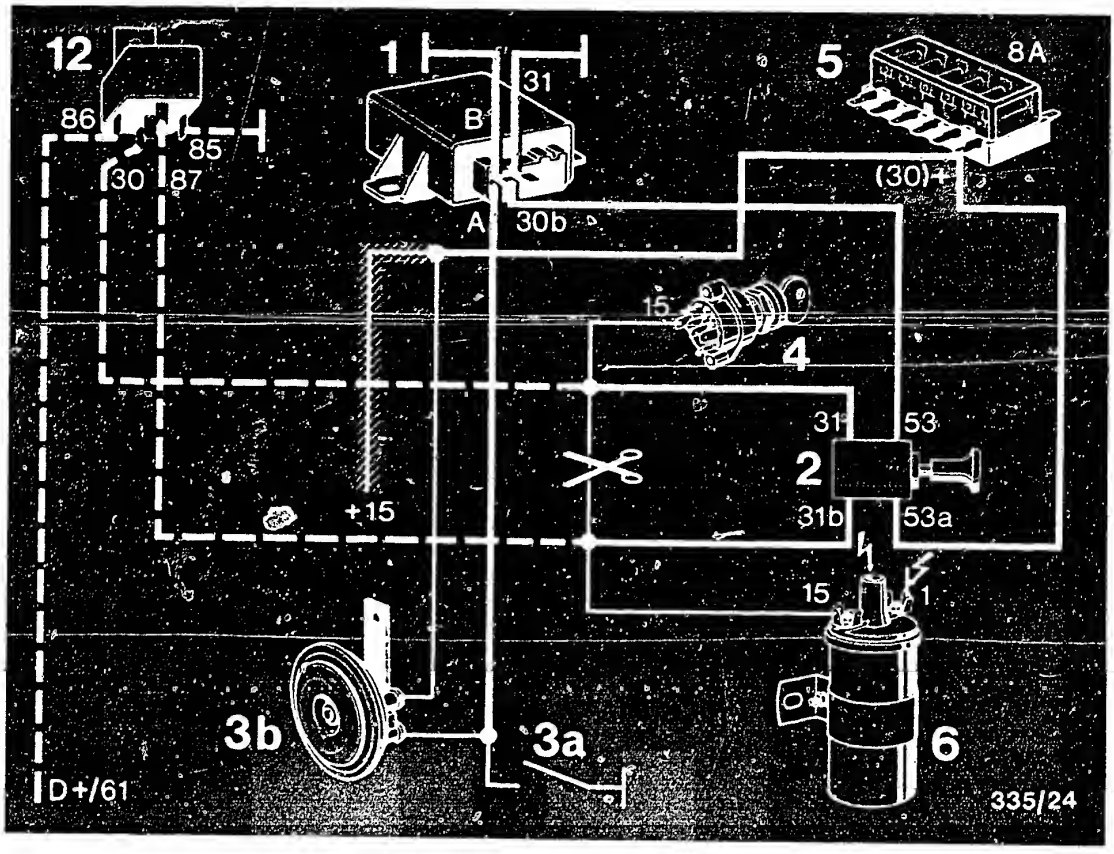


1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-open contact)

4.1.4 Basic circuit with ignition immobilization (Car Alarm I) with separate alarm horn

Alarm switch 2 switches "positive" (+) to alarm relay 1 (earlier circuit without "safety relay" 12).

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

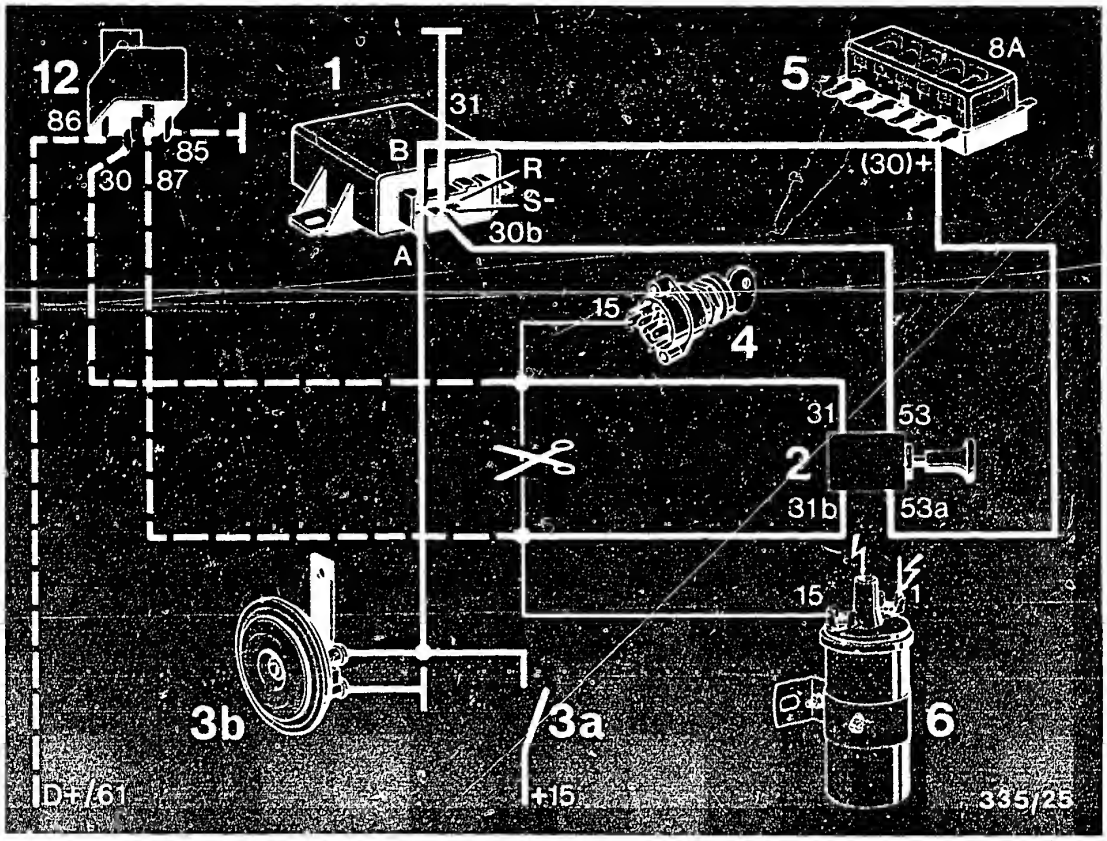


1 = Alarm relay
2 = Alarm switch
3a = Switch for standard horn
3b = Standard horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-open contact).

4.1.5 Basic circuit with ignition immobilization (Car Alarm I) with standard horn

Alarm switch (2) switches "positive" (+) to alarm relay. Horn switch switches "negative".

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

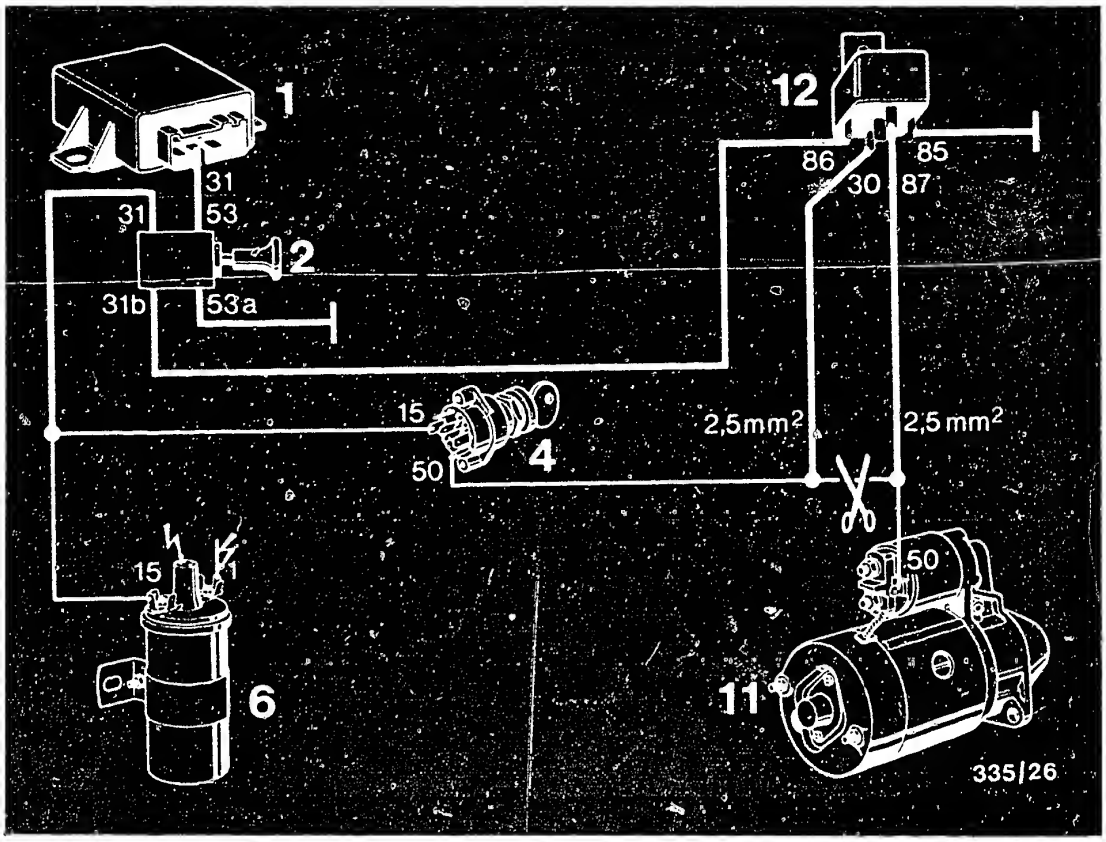


1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-open contact)

4.1.6 Basic circuit with ignition immobilization (Car Alarm I) with standard horn

Alarm switch 2 switches "positive" (+) to alarm relay 1, horn switch switches "positive".
(Earlier circuit without relay 12).

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

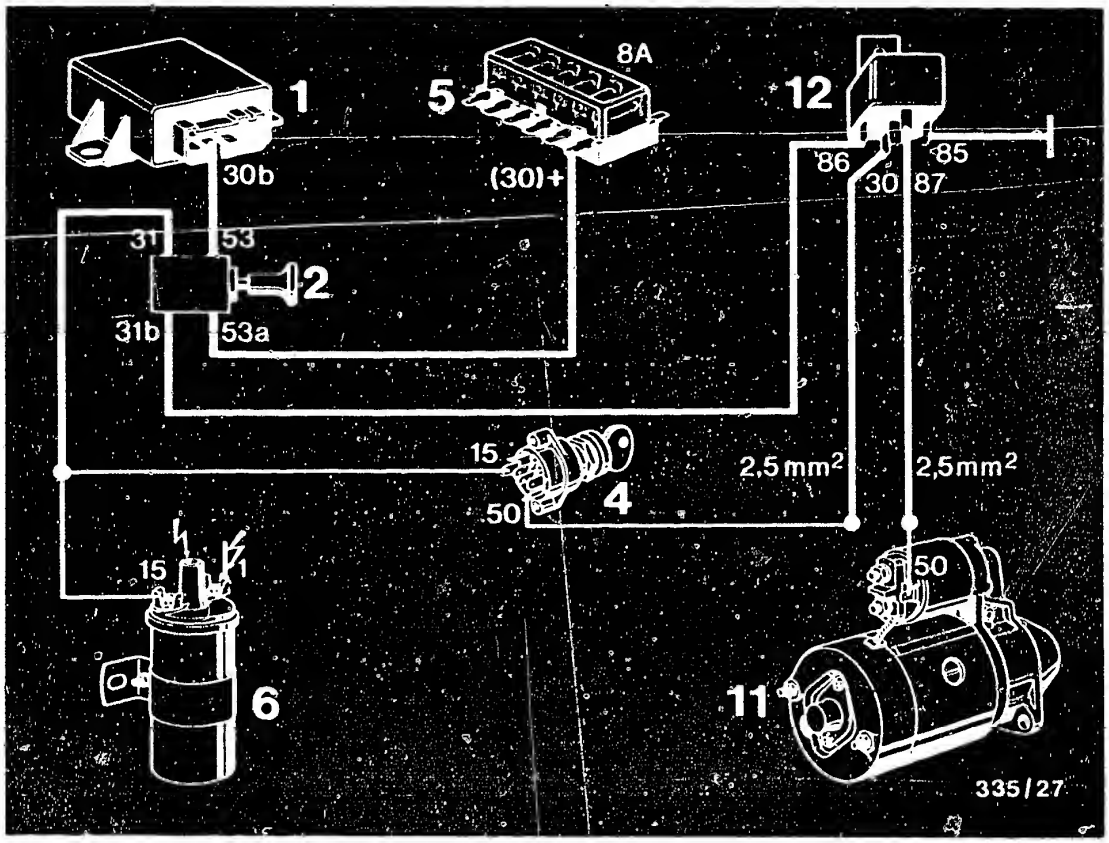


1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
6 = Ignition coil
11 = Starting motor
12 = Auxiliary relay (12 V, change-over contact, here as normally-closed contact)

4.1.7 Basic circuit with starting motor immobilization (Car Alarm I)

Alarm switch 2 switches "negative" (-) to alarm relay 1.

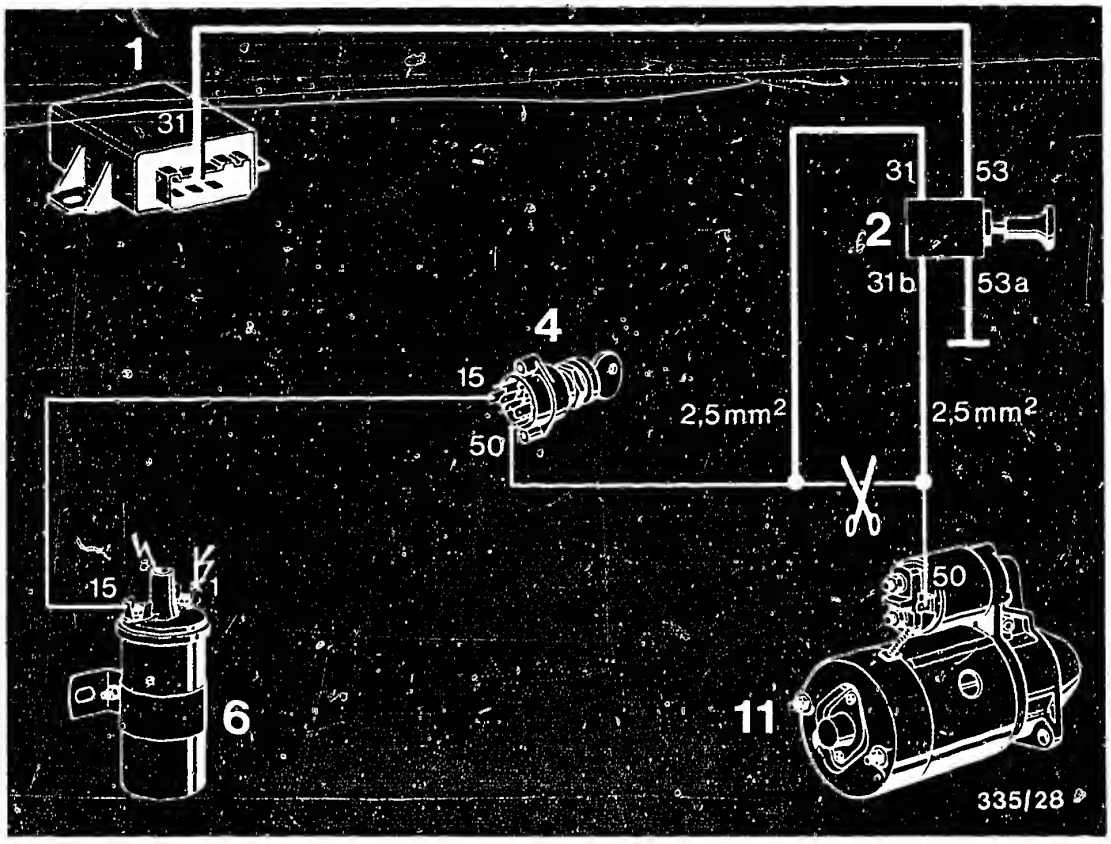
(Earlier circuit, now without relay (12).)



1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
11 = Starting motor
12 = Auxiliary relay (12 V, change-over contact, here as normally-closed contact)

4.1.8 Basic circuit with starting motor immobilization (Car Alarm I)

Alarm switch 2 switches "positive" (+) to alarm relay 1 (earlier circuit without relay (12).)

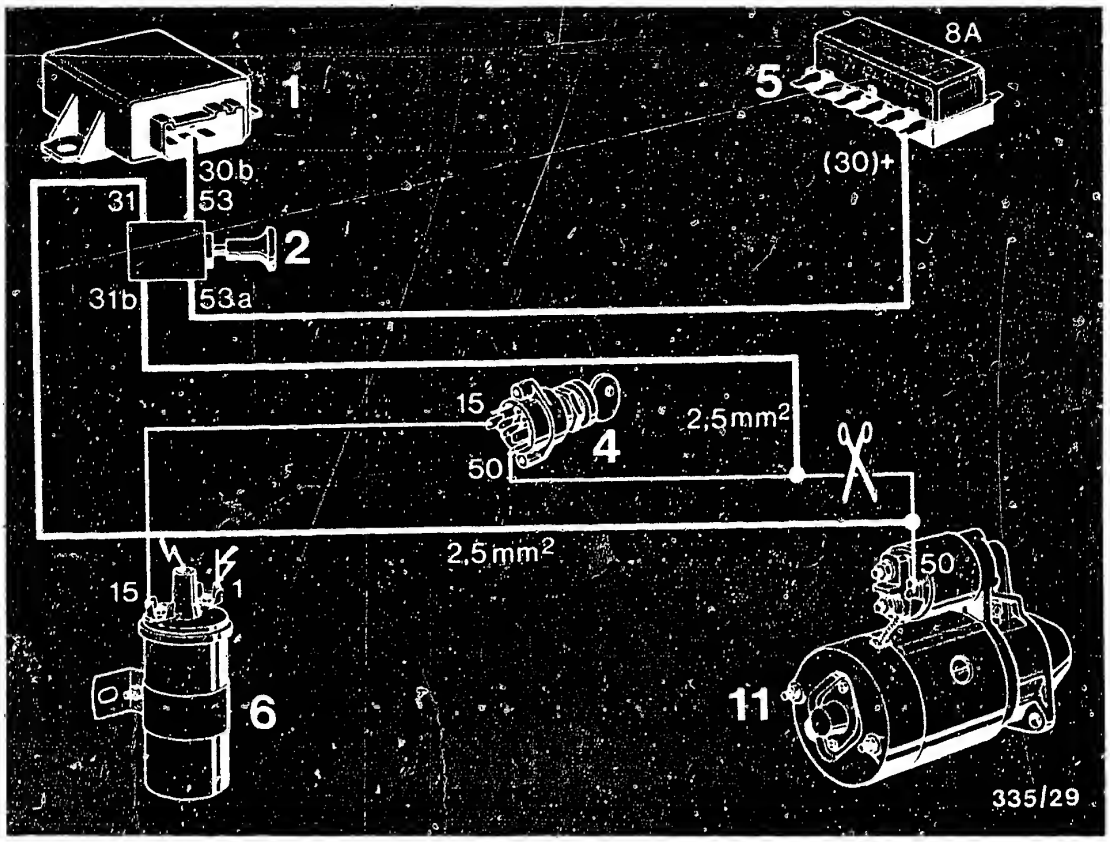


1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
6 = Ignition coil
11 = Starting motor

4.1.9 New basic circuit with starting motor immobilization (Car Alarm I)

Alarm switch 2 switches "negative" (-) to alarm relay 1.

Can also be used for vehicles with electronic ignition system/Motronic.

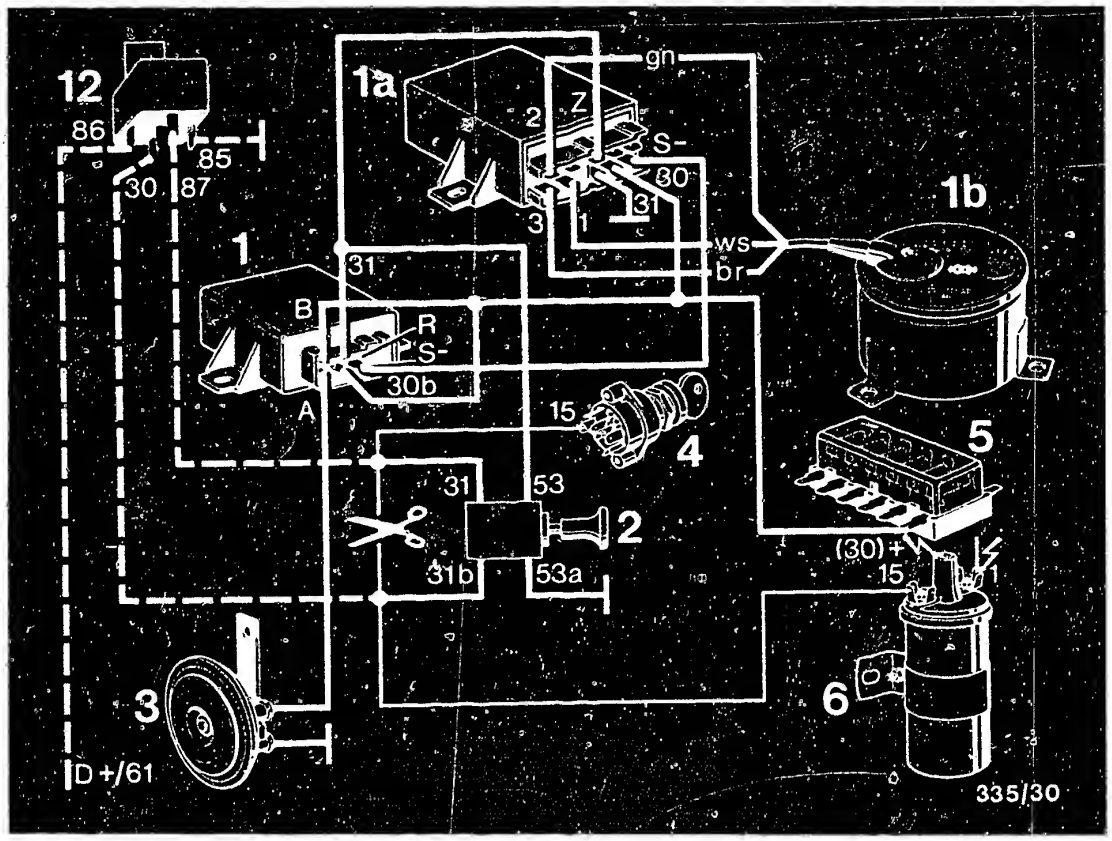


1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
11 = Starting motor

4.1.10 New basic circuit with starting motor immobilization (Car Alarm I)

Alarm switch 2 switches "positive" (+) to alarm relay 1.

Can also be used for vehicles with electronic ignition system/Motronic.

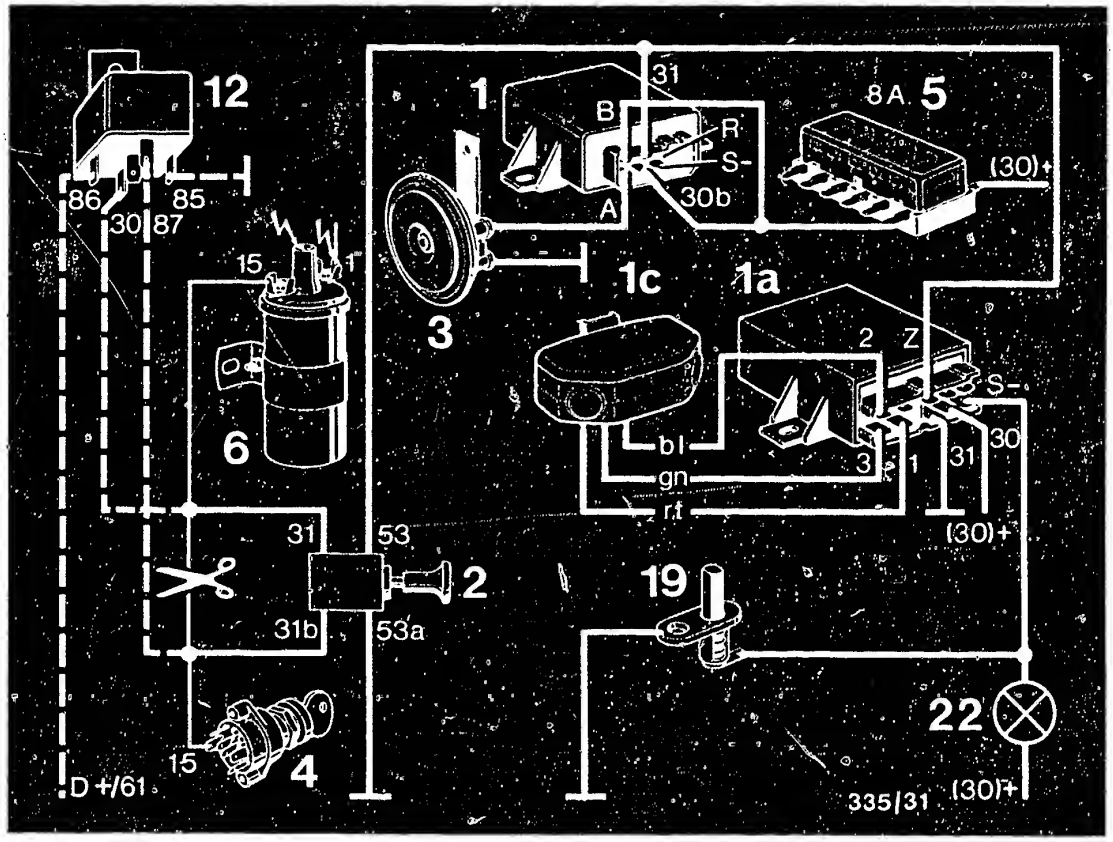


1 = Alarm relay
1a = Trigger box for evaluation electronics
1b = Angle sensor
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-open contact)

br = brown
gn = green
ws = white

4.1.11 Basic circuit - Car Alarm I with Car Alarm Plus 3 (wheel protection)

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

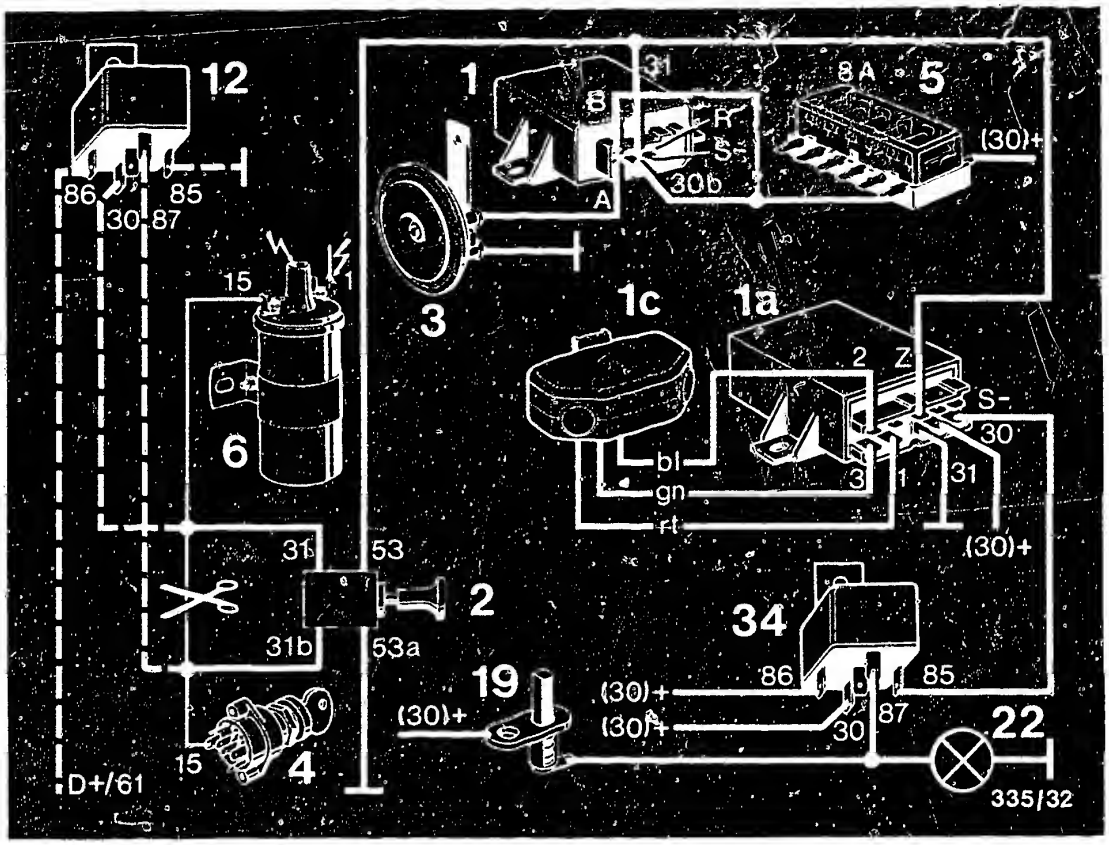


1 = Alarm relay
1a = Evaluation electronics
1c = Ultrasonic movement detector
2 = Alarm switch (push-pull switch)
3 = Alarm horn
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-open contact)
19 = Door-contact switch
22 = Interior lamp

bl = blue
gn = green
rt = red

4.1.12 Basic circuit-Car Alarm I with Car Alarm Plus 4 (ignition immobilization)

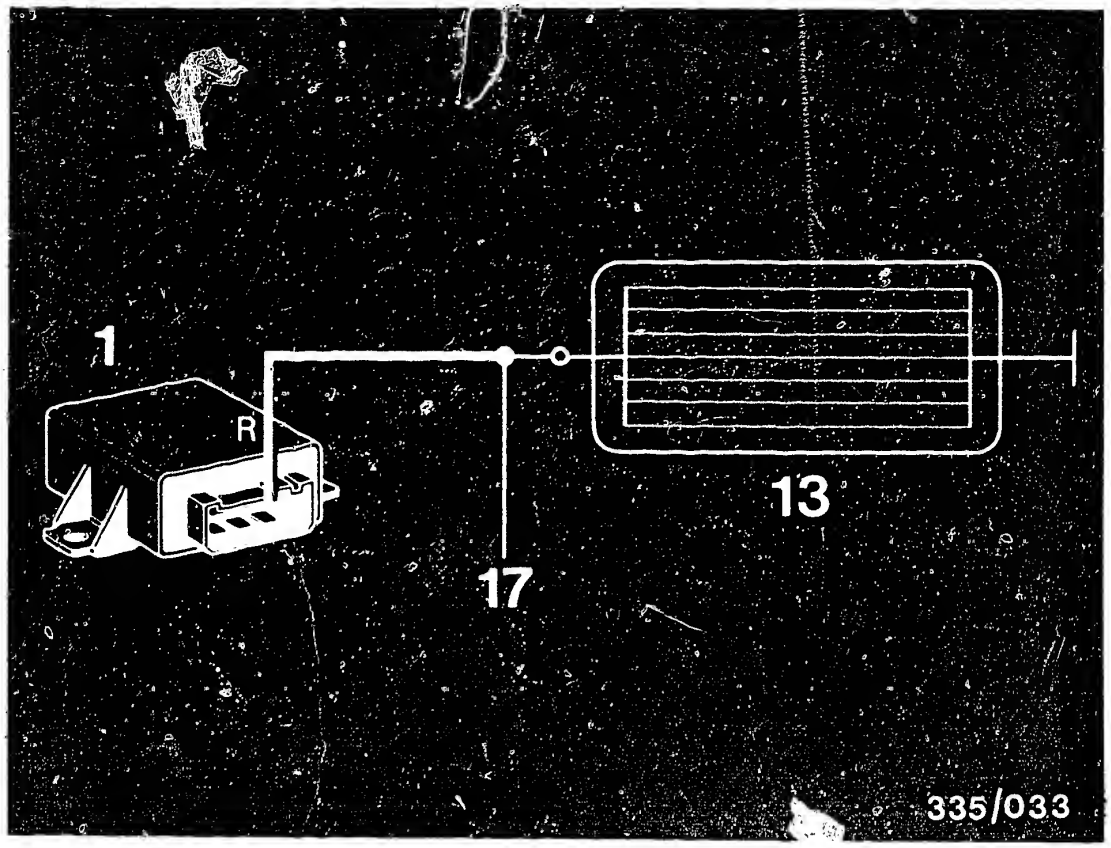
Alarm switch 2 switches "negative" to alarm relay.
Door-contact switch switches negative.
In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.



1 = Alarm relay
2a = Evaluation electronics
1c = Ultrasonic movement detector
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
12 = Relay (12 V change-over contact, here as normally-open contact)
19 = Door-contact switch
22 = Interior lamp
34 = Relay (12 V, twin normally-open contact)
bl = blue
gn = green
rt = red

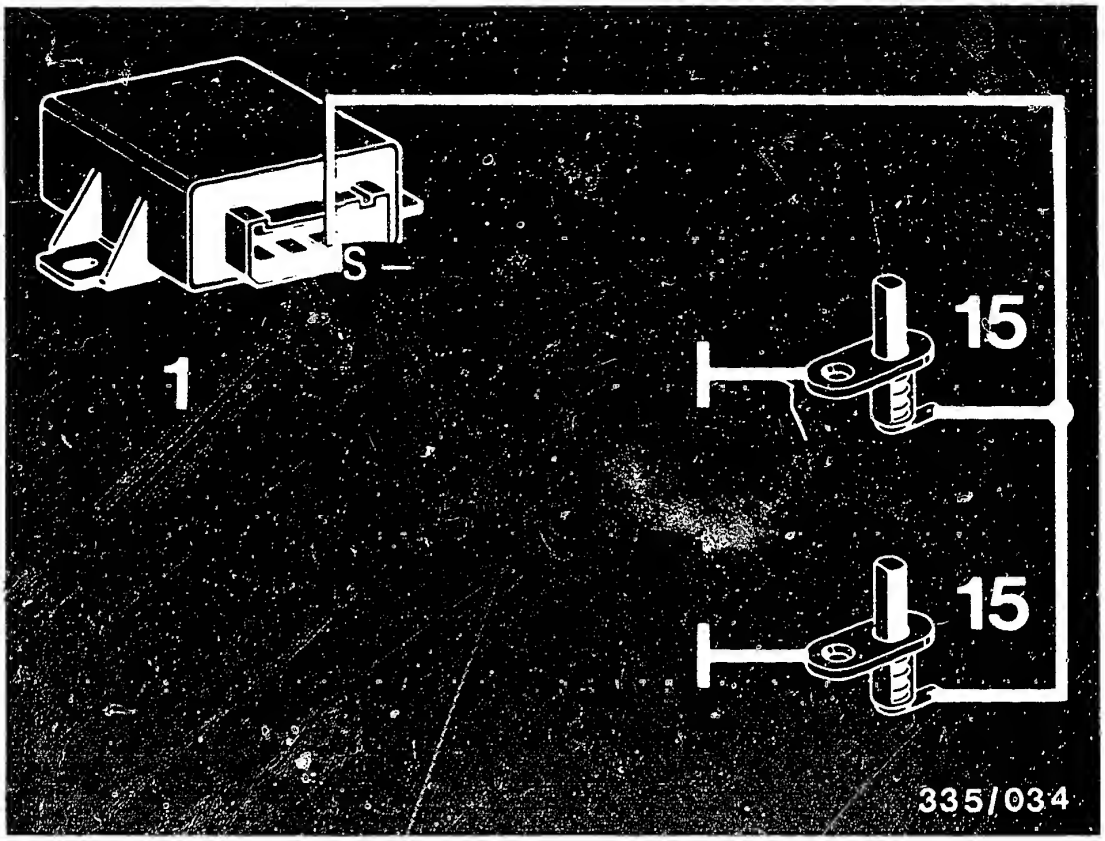
4.1.13 Basic circuit-Car Alarm I with Car Alarm Plus 4 (ignition immobilization)

Alarm switch 2 switches "negative" to alarm relay. Door-contact switch switches "positive".
In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.



1 = Alarm relay
13 = heated rear window
17 = to switch/relay for heated rear window

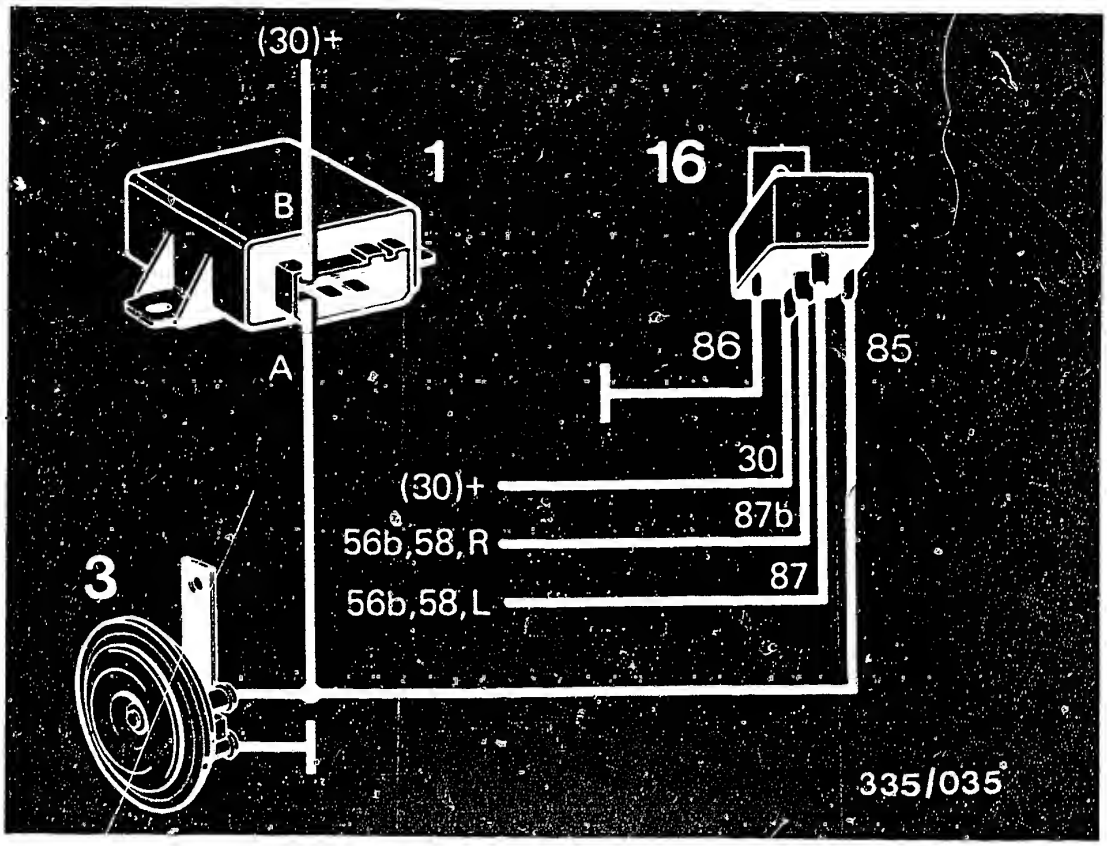
4.1.14 Auxiliary circuit for protecting the rear window through heating circuit for rear window, for Car Alarm I



1 = Alarm relay
15 = Contact switch

4.1.15 Auxiliary circuit for Car Alarm I

Protection of luggage compartment and engine hood by 2 contact switches (15).



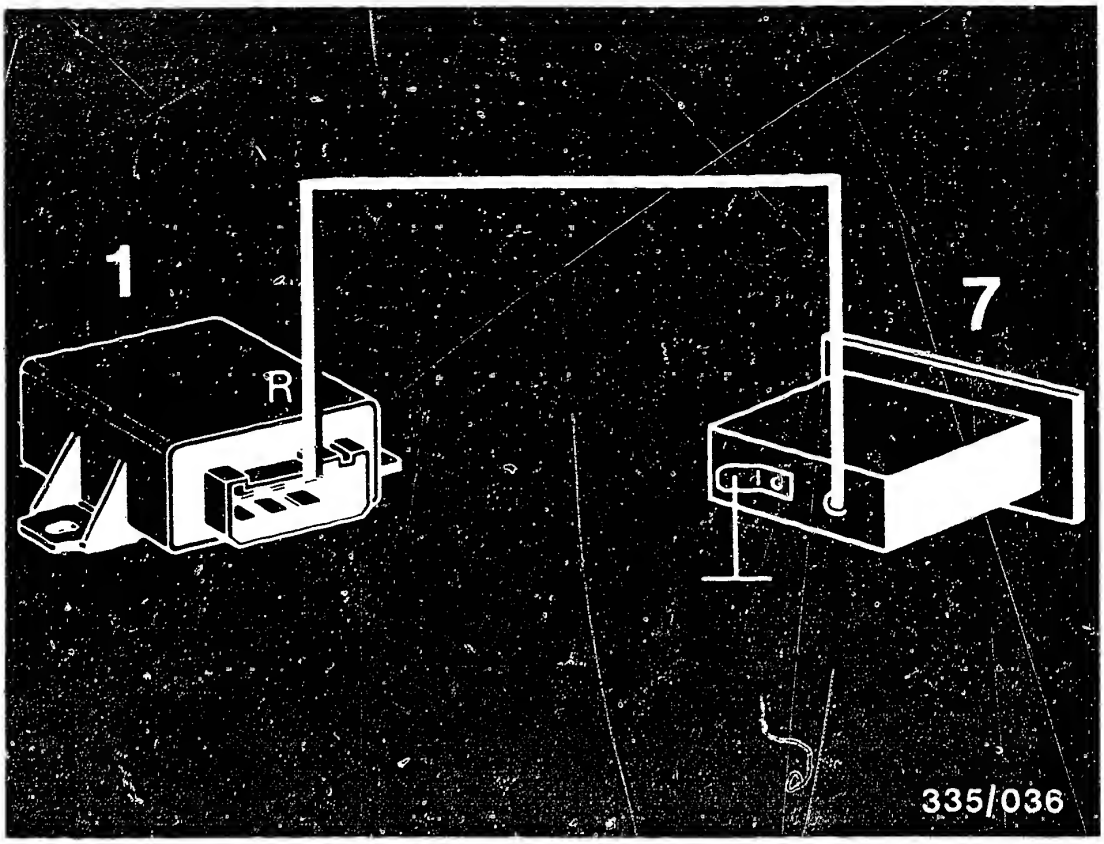
1 = Alarm relay
3 = Alarm horn
16 = Auxiliary relay (12 V, twin normally-open contact)

4.1.16 Auxiliary circuit for Car Alarm I

Auxiliary visual alarm via auxiliary relay (16)

Note:

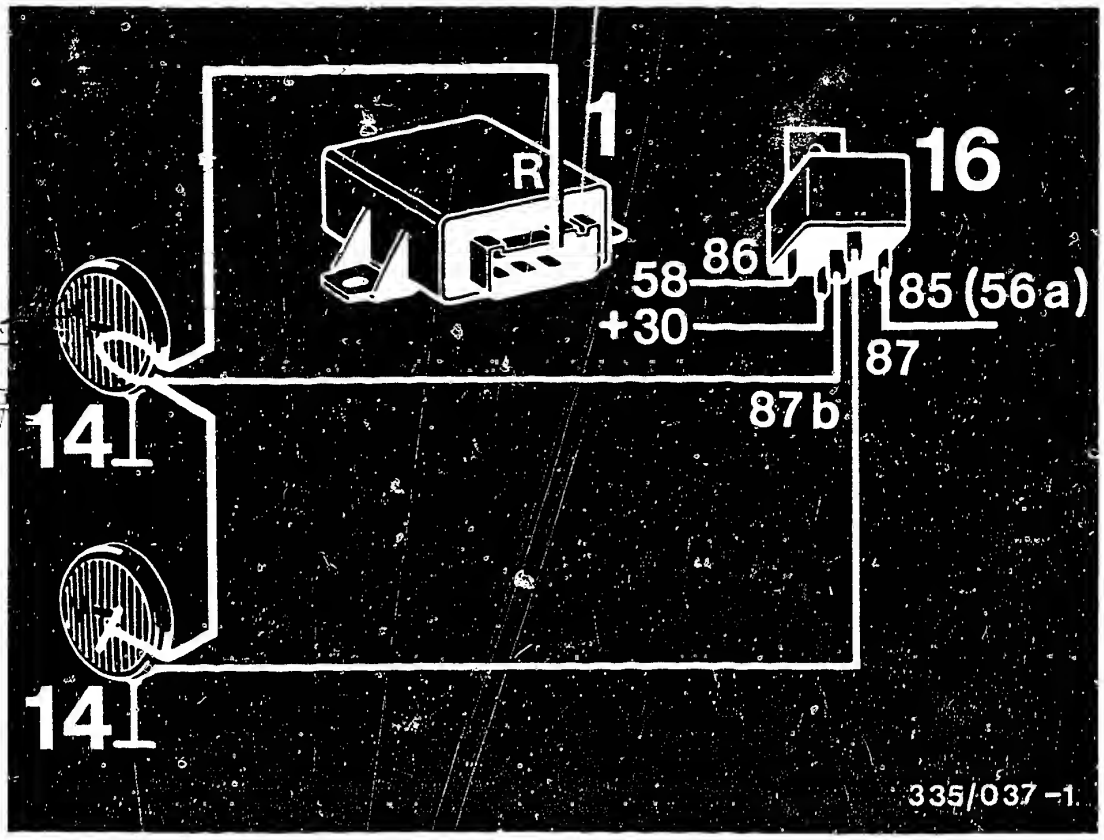
Not allowed in the Federal Republic of Germany.



1 = Alarm relay
7 = Car radio

4.1.17 Auxiliary circuit for Car Alarm I

Protection of car radio



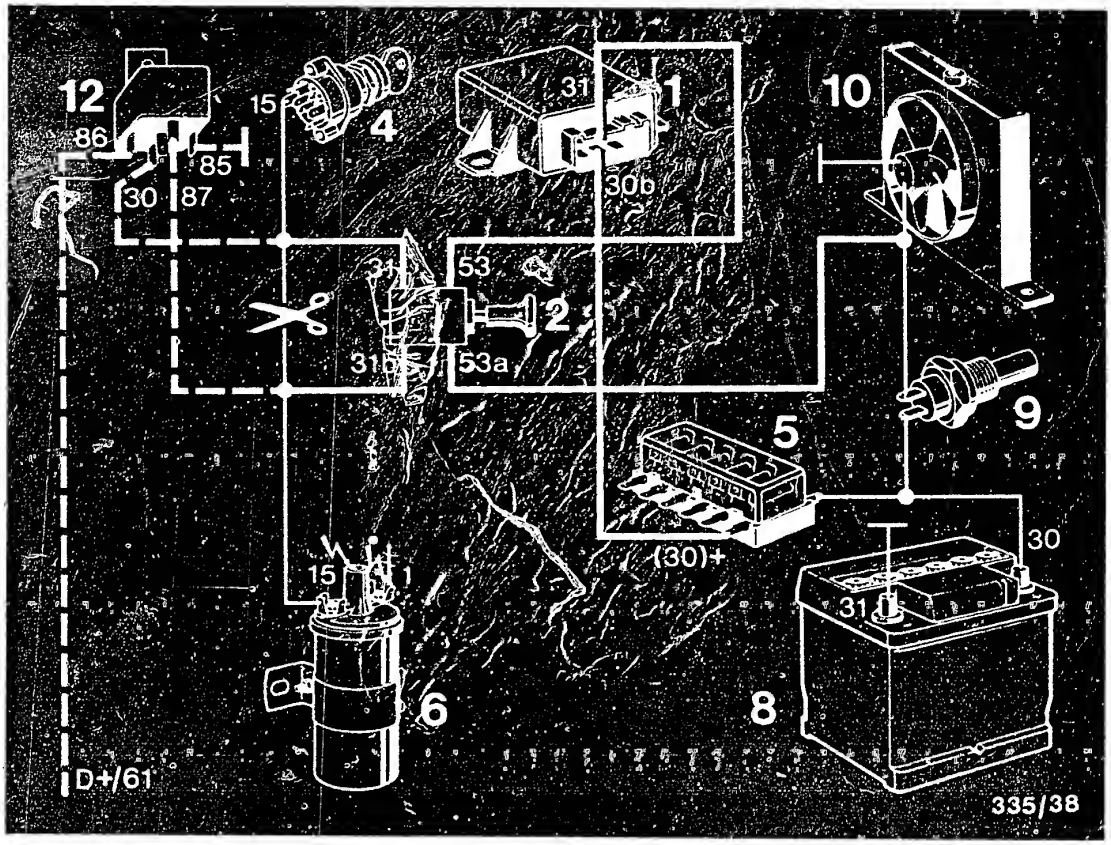
1 = Alarm relay
14 = Auxiliary lamp
16 = Auxiliary relay (12 V, twin normally-open contact)

4.1.18 Auxiliary circuit for Car Alarm I

Protection of auxiliary lamps

Note:

Not allowed in the Federal Republic of Germany.

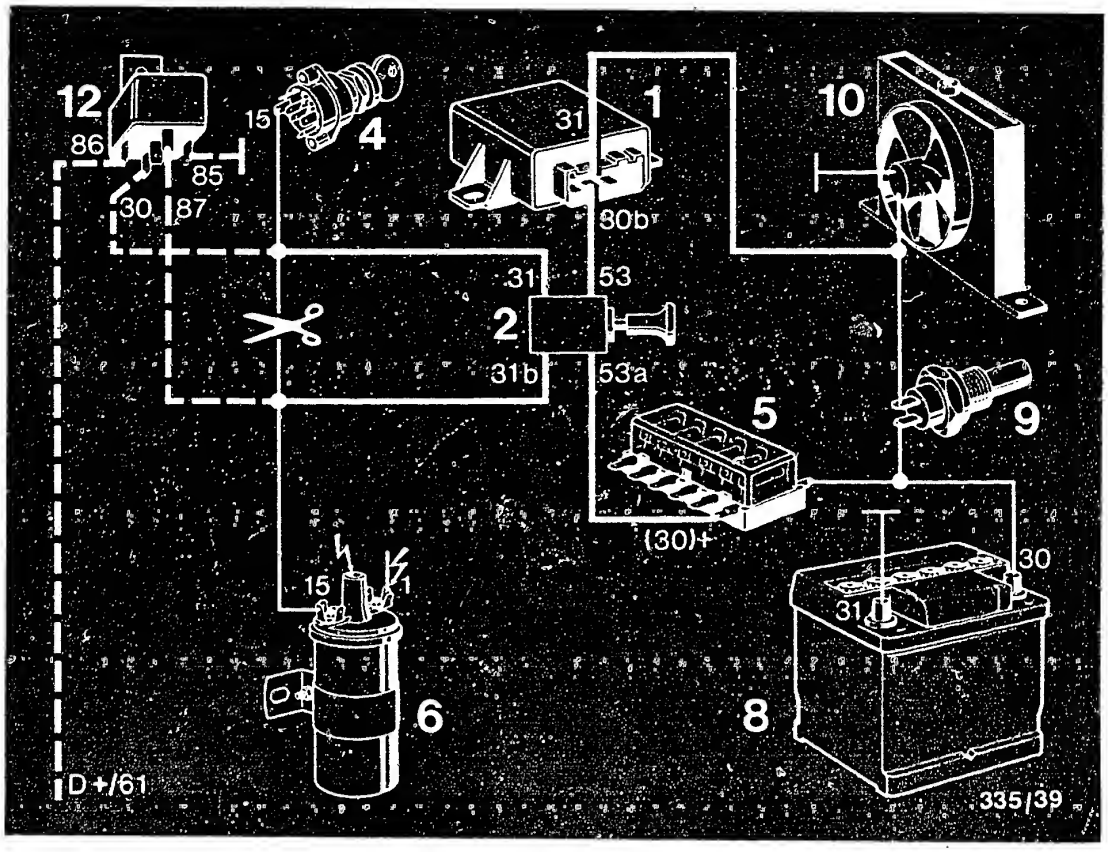


1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
8 = Battery
9 = Thermo-switch/switching relay
10 = Radiator fan
12 = Relay (12 V, change-over contact, here as normally-open contact)

4.1.19 Special circuit for Car Alarm I

Prevention of alarm through startup of radiator fan (+switched) with vehicle parked

Alarm switch 2 switches "negative" to alarm relay 1. In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

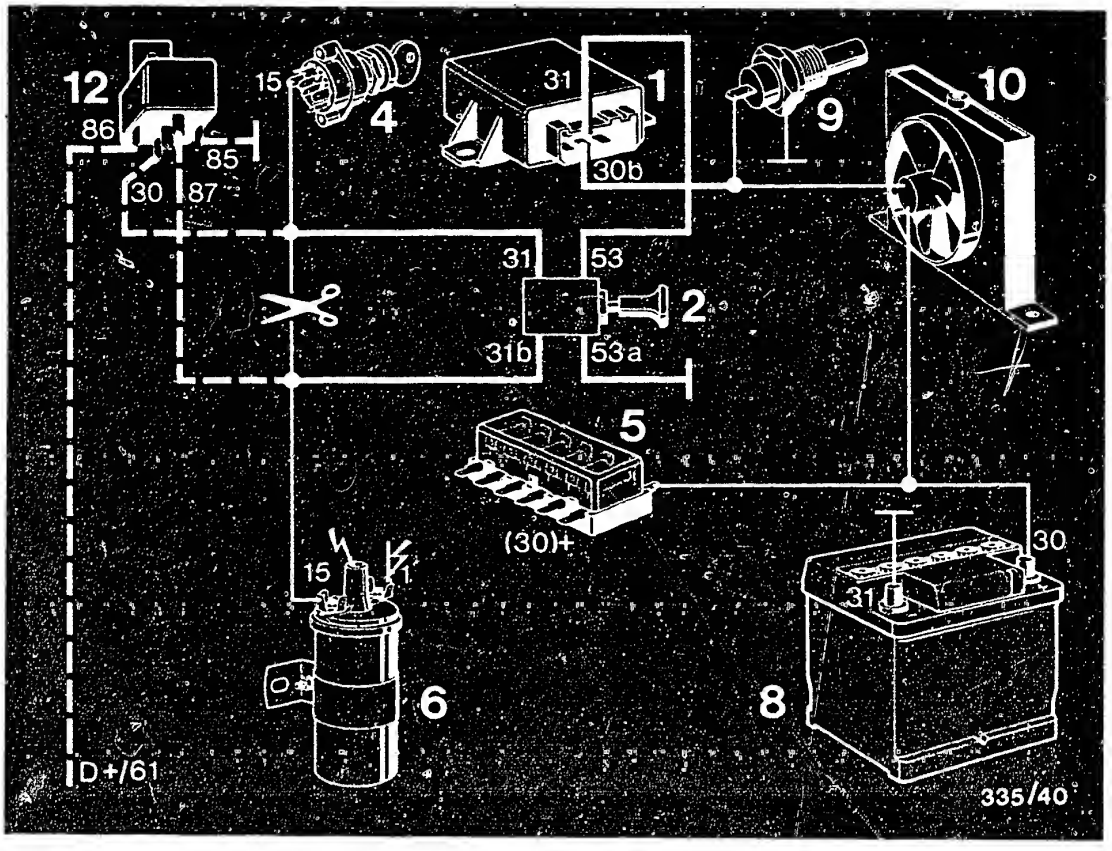


1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
8 = Battery
9 = Thermo-switch/switching relay
10 = Radiator fan
12 = Relay (12 V, change-over contact, here as normally-open contact)

4.1.20 Special circuit for Car Alarm I

Prevention of alarm through startup of radiator fan (+switched) with vehicle parked

Alarm switch 2 switches "positive" to alarm relay 1. In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

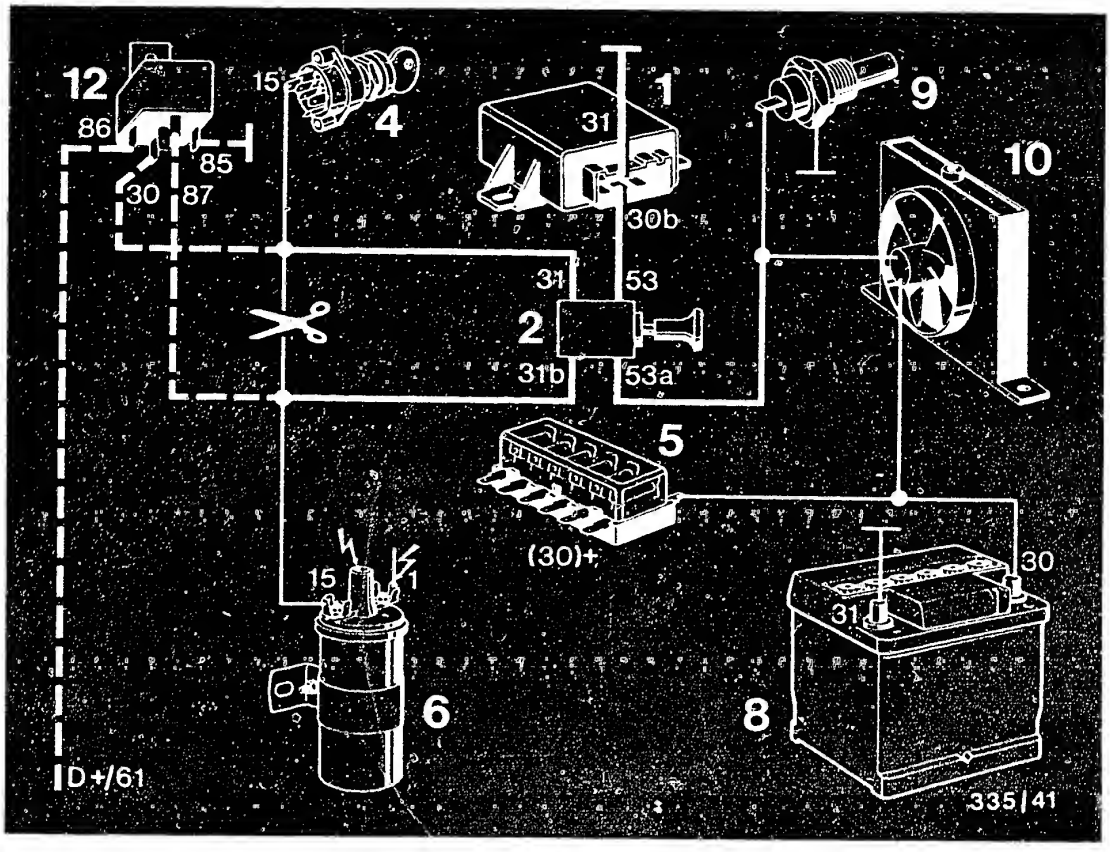


1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
8 = Battery
9 = Thermo-switch/switching relay
10 = Radiator fan
12 = Relay (12 V, change-over contact, here as normally-open contact)

4.1.21 Special circuit for Car Alarm I

Prevention of alarm through startup of radiator fan (-switched) with vehicle parked

In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.

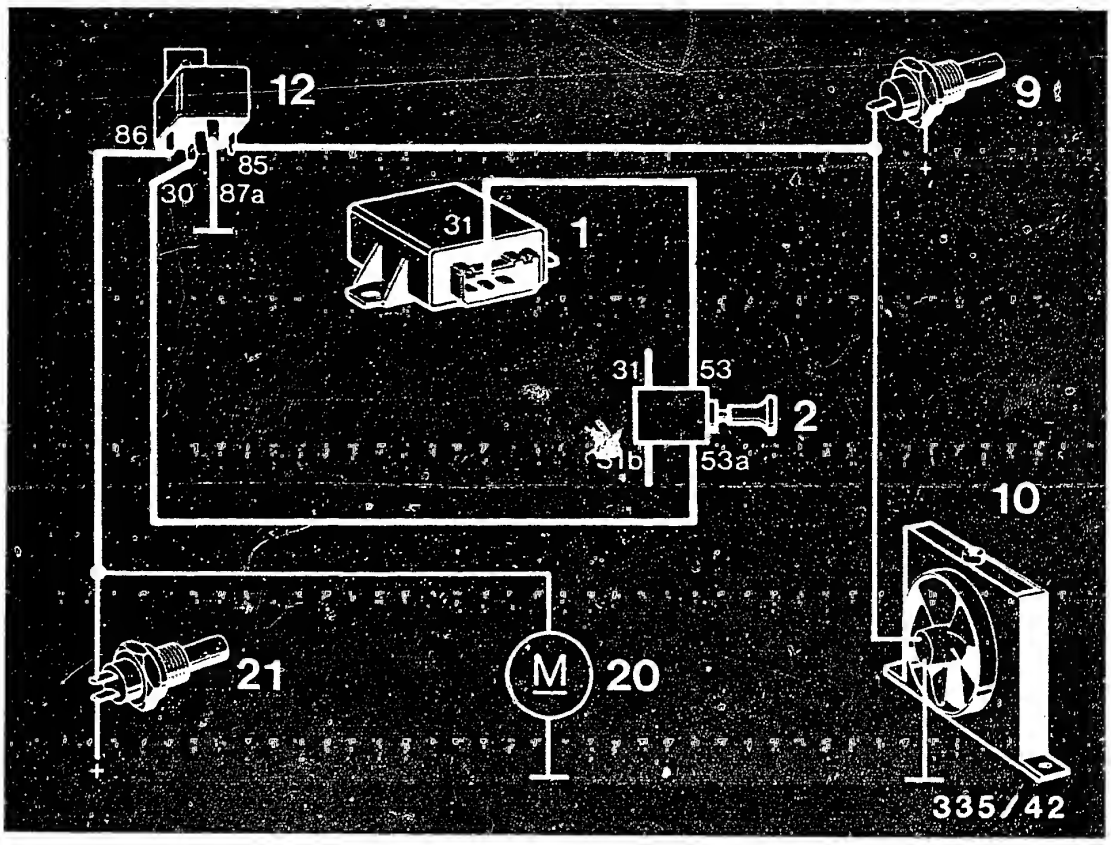


1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
8 = Battery
9 = Thermo-switch/switching relay
10 = Radiator fan
12 = Relay (12 V, change-over contact, here as normally-open contact)

4.1.22 Special circuit for Car Alarm I

Prevention of alarm through startup of radiator fan

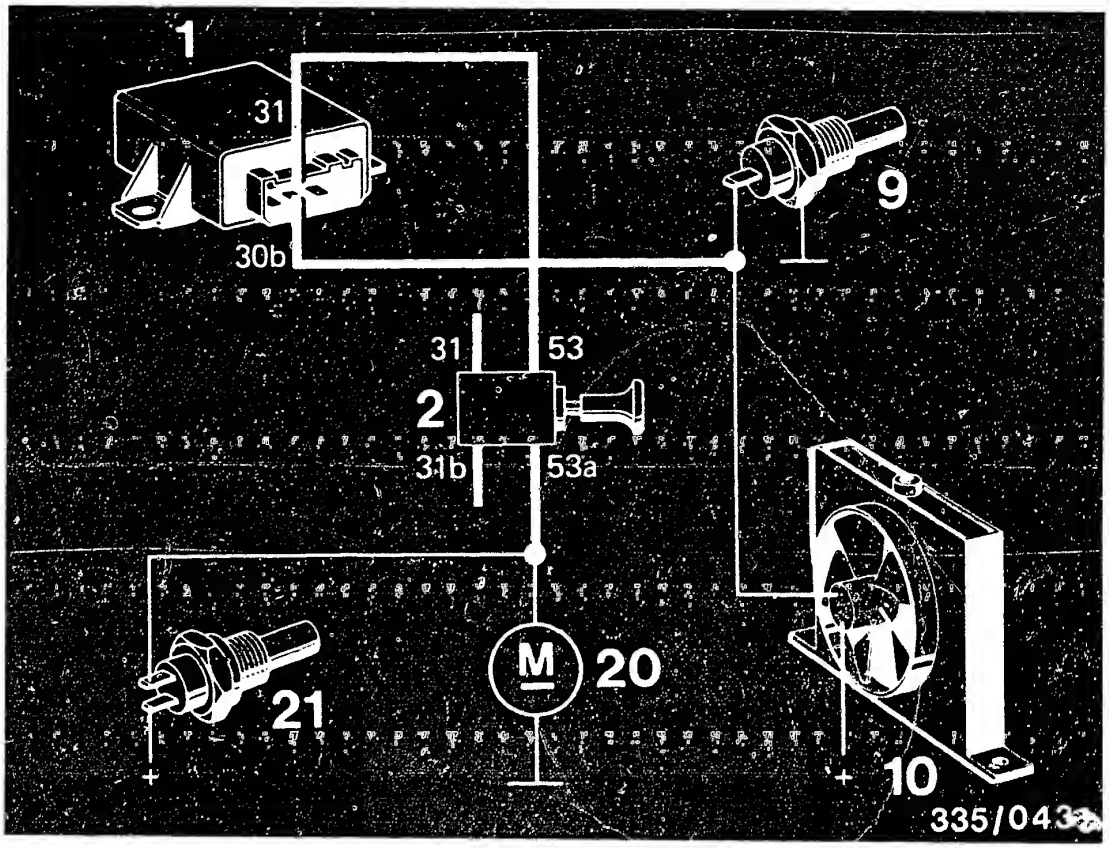
Alarm switch 2 switches "positive" to alarm relay 1. In order to prevent unintentional switching-off of the ignition while driving, an additional relay (12) can be installed.



1 = Alarm relay
2 = Alarm switch
9 = Thermo-switch/switching relay
10 = Radiator fan
12 = Auxiliary relay (12 V, change-over contact, here as normally-closed contact)
20 = Heating blower motor
21 = Thermostat switch for heating blower motor

4.1.23 Special circuit for Car Alarm I

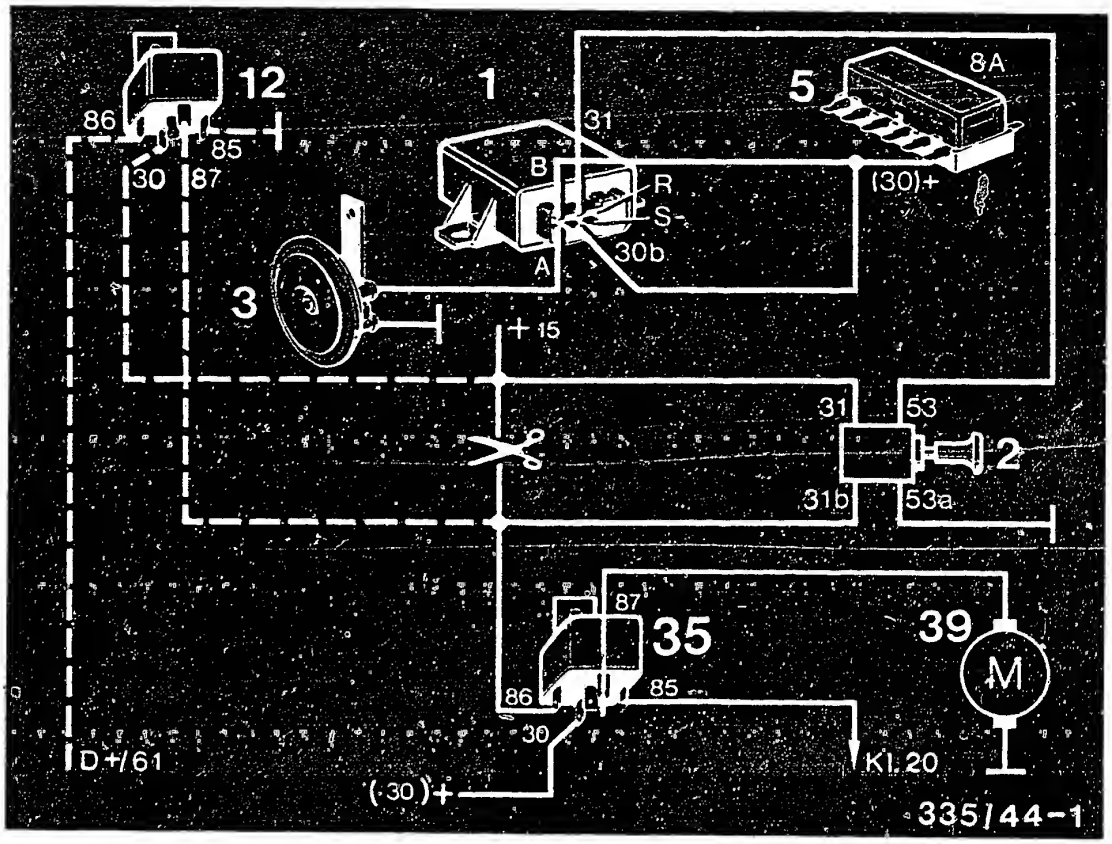
Prevention of alarm by auxiliary relay (12) through startup of heating blower motor (+switched) in conjunction with auxiliary heater with vehicle parked.



1 = Alarm relay
2 = Alarm switch
9 = Thermo-switch/ switching relay
10 = Radiator fan
20 = Heating blower motor
21 = Thermostat switch for heating blower motor

4.1.24 Special circuit for Car Alarm I

Prevention of alarm through startup of heating blower motor (-switched), in conjunction with auxiliary heater with vehicle parked.

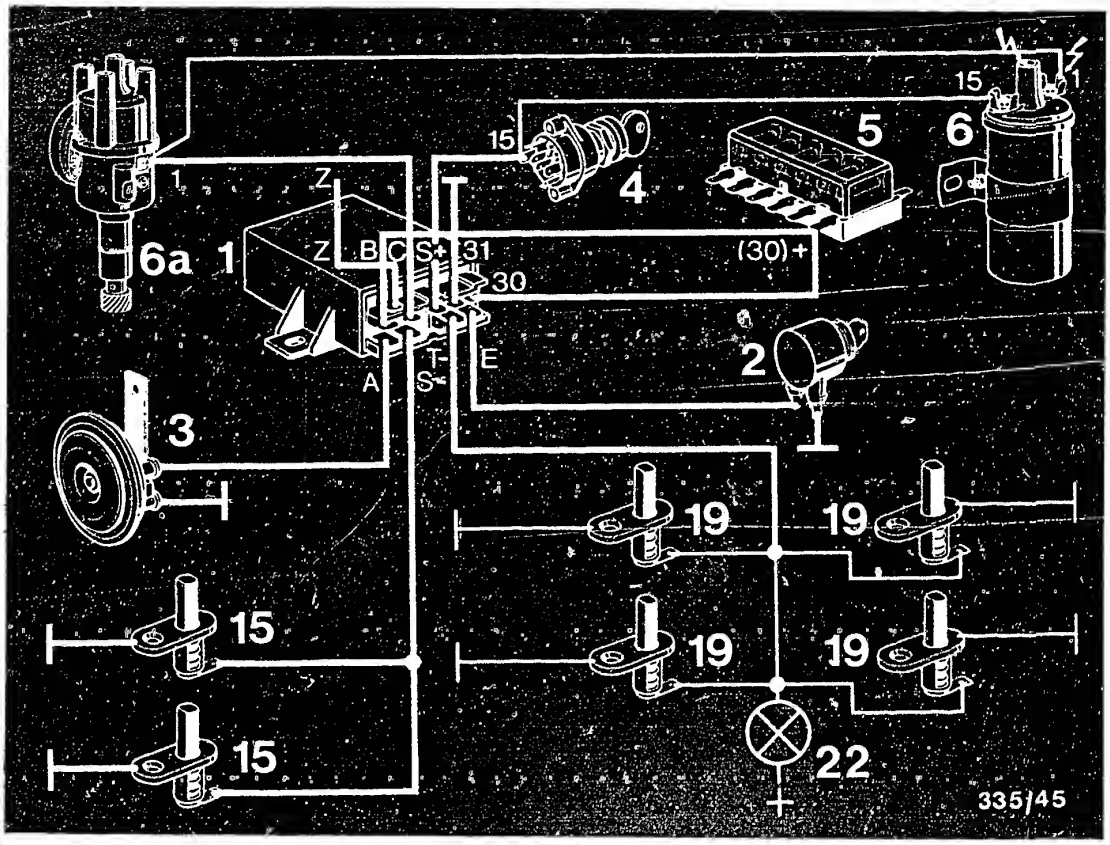


1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
5 = Fuse box (8 A fuse)
12 = Relay (12 V, change-over contact, here as normally-open contact)
35 = Electric fuel pump relay
39 = Electric fuel pump

4.1.25 Special circuit for Car Alarm I

Circuit for vehicles with Motornic

In order to prevent unintentional switching-off of the electric fuel pump relay while driving, an additional relay (12) can be installed.

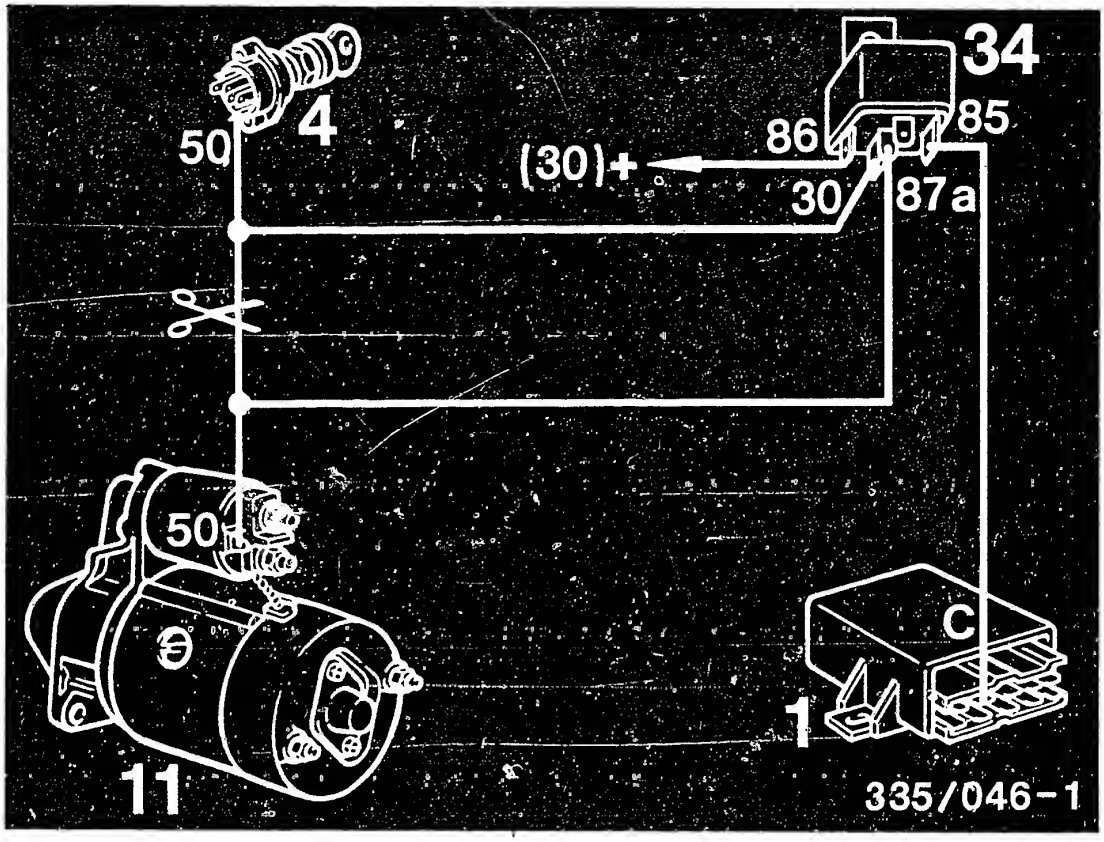


1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
6a = Ignition distributor
15 = Contact switch (luggage compartment, engine hood)
19 = Door-contact switch
22 = Interior lamp

4.2 Circuit diagrams - Car Alarm II

4.2.1 Basic circuit with ignition immobilization. Door-contact switch switches "negative" (Car Alarm II)

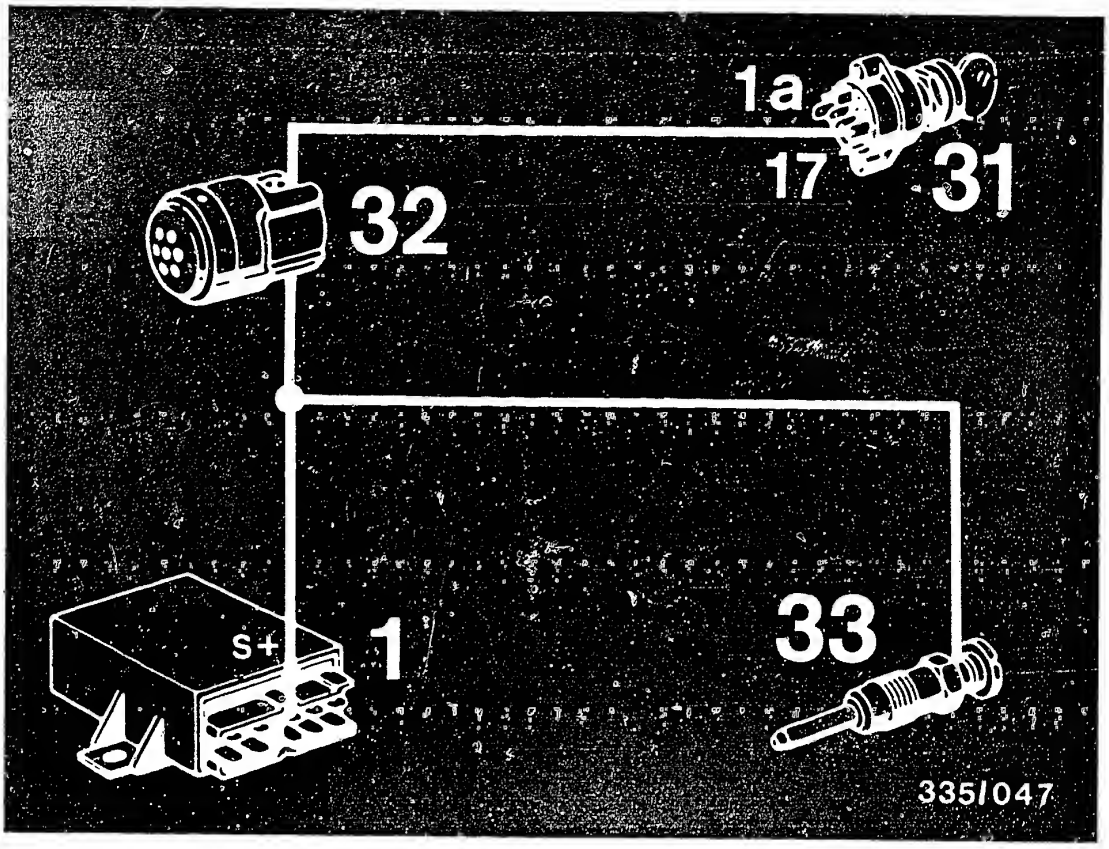
Does not apply to vehicles with electronic ignition systems or Motronic.



1 = Alarm relay
4 = Ignition/starting (driving) switch
11 = Starting motor
34 = Relay (12 V, change-over contact, here as normally-closed contact)

4.2.2 Basic circuit with starting motor immobilization (Car Alarm II)

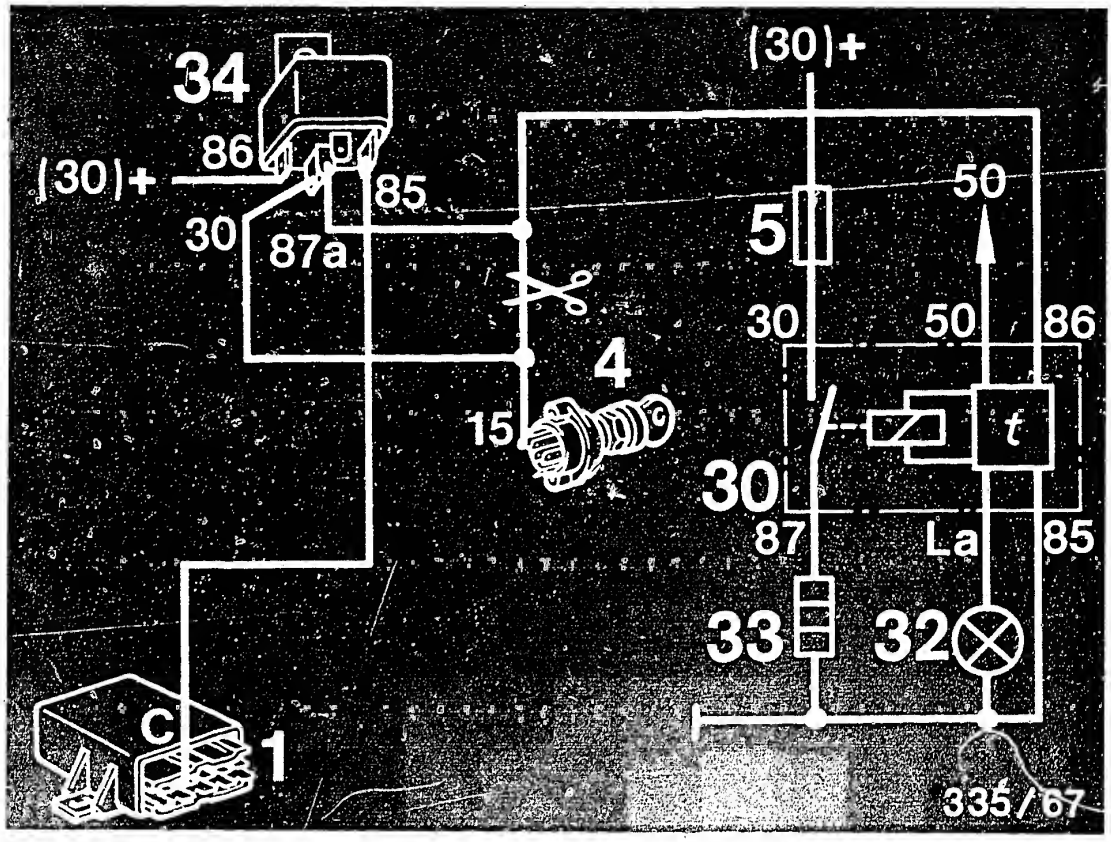
Can be used for vehicles with electronic ignition or Motronic.



1 = Alarm relay
32 = Glow-plug monitor
31 = Glow-plug switch term.19
32 = Glow plug

4.2.3 Basic circuit - Glow plug immobilization (Car Alarm II)

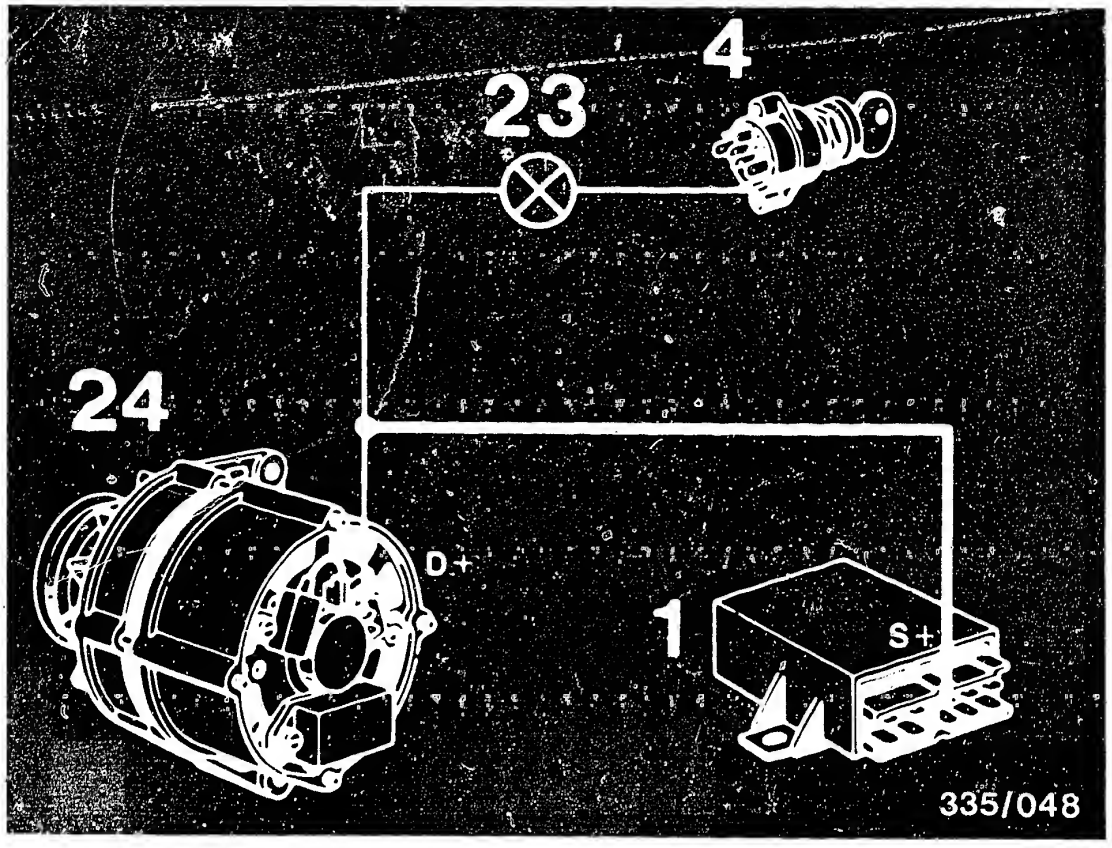
For Diesel vehicles in conjunction with starting motor immobilization.



1 = Alarm relay
4 = Ignition/starting (driving) switch
5 = Fuse
30 = Glow-duration unit
32 = Indicator (readiness for starting)
33 = Glow plug
34 = Relay (12 V) change-over contact, here as normally-closed contact

4.2.4 Basic circuit - glow plug immobilization (Car Alarm II) with glow-duration unit

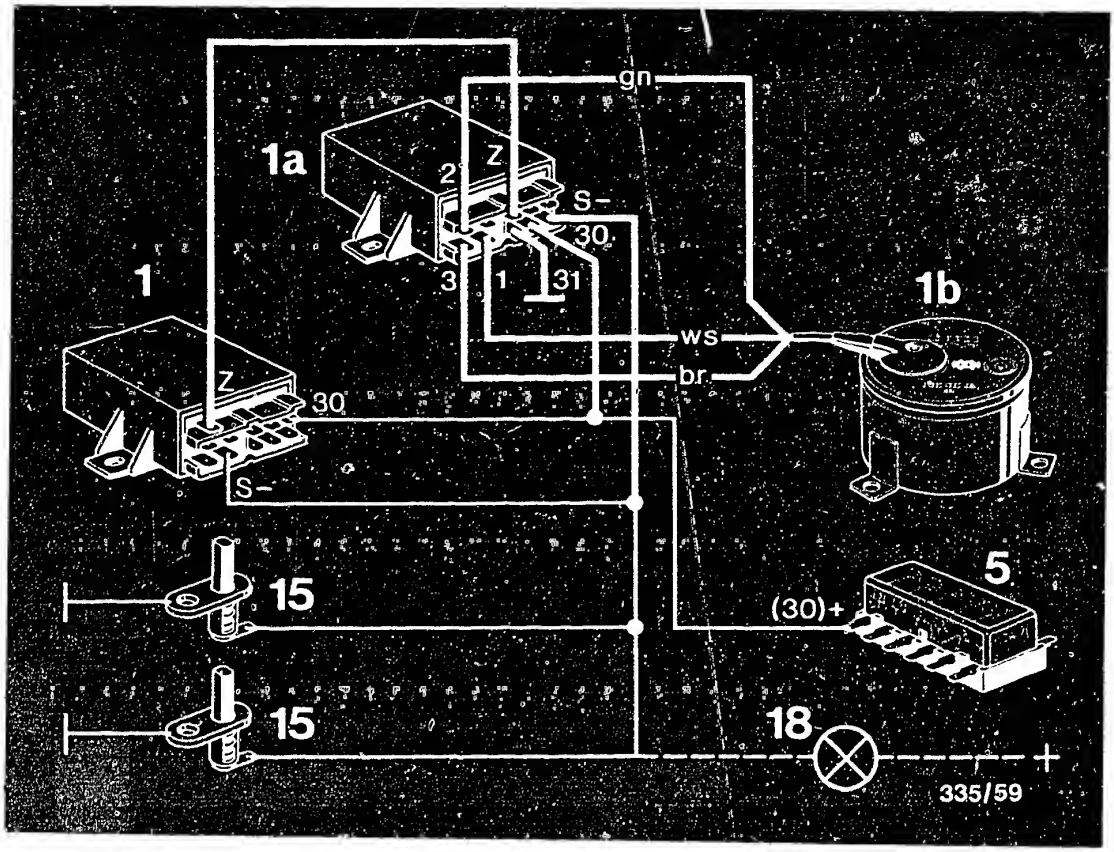
For Diesel vehicles in conjunction with starting immobilization. Lead 15 to the glow-duration unit is open-circuited by auxiliary relay.



1 = Alarm relay
4 = Ignition/starting (driving) switch
23 = Charge indicator lamp
24 = Alternator

4.2.5 Basic circuit via alternator (Car Alarm II)

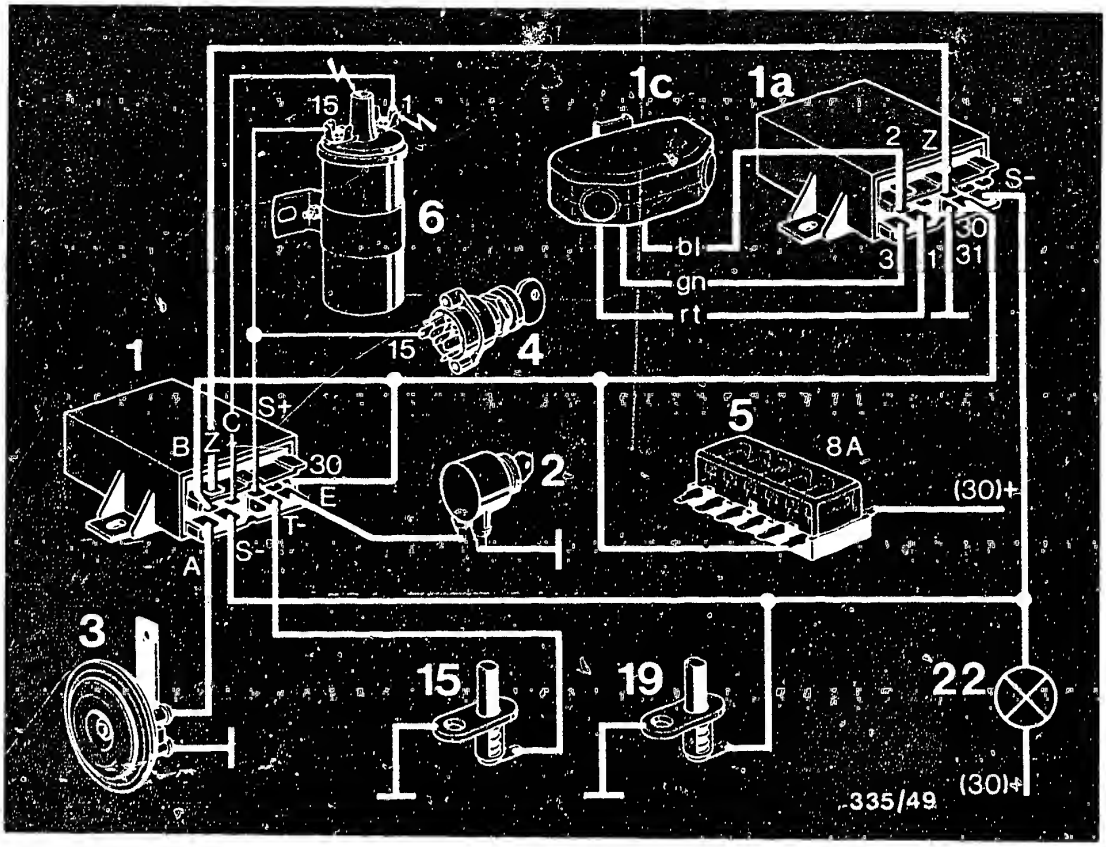
Triggering of alarm through running of alternator.



1 = Alarm relay
1a = Evaluation electronics trigger box
1b = Angle sensor
5 = Fuse box (8 A fuse)
15 = Contact switch
18 = Luggage compartment/engine compartment lamp

br = brown
gn = green
ws = white

4.2.6 Basic circuit - Car Alarm II with Car Alarm Plus 3 (wheel protection)

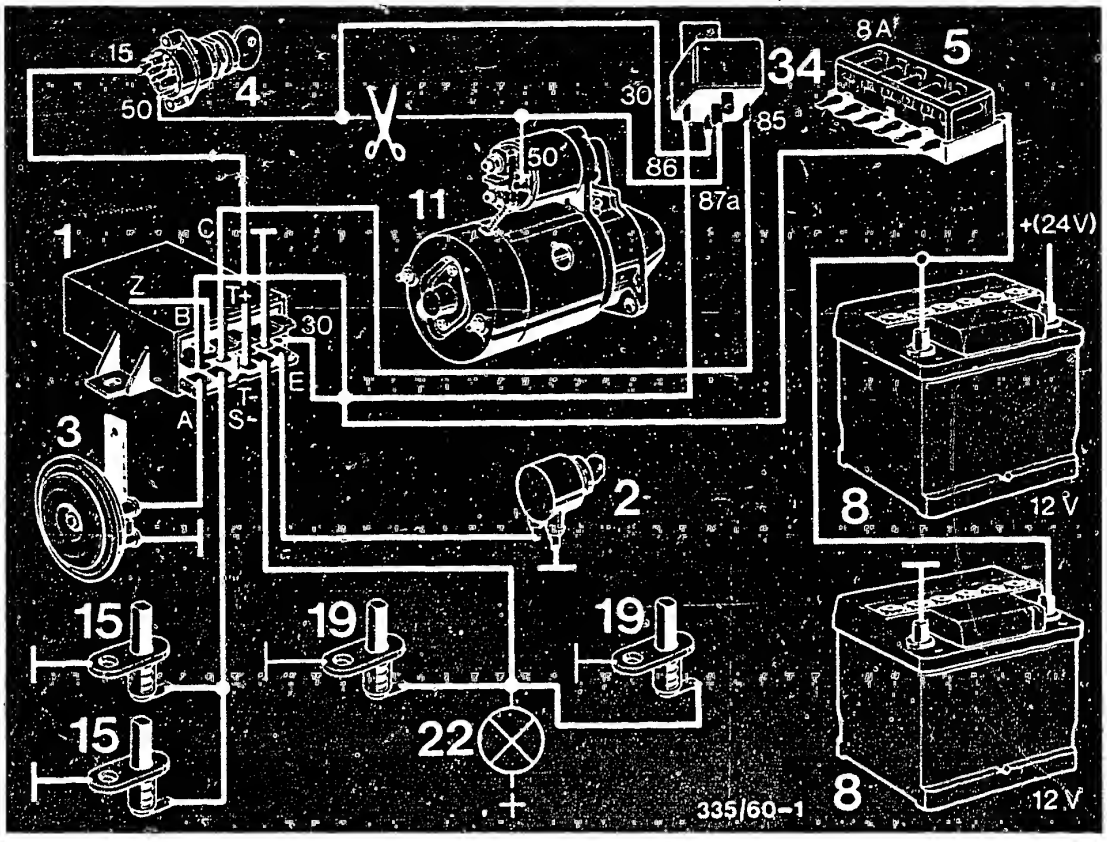


1 = Alarm relay
1a = Evaluation electronics
1c = Ultrasonic movement detector
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
15 = Contact switch for engine hood/luggage compartment
19 = Door contact
22 = Interior lamp

bl = blue
gn = green
rt = red

4.2.7 Basic circuit - Car Alarm II with Car Alarm Plus 4 (ignition immobilization)

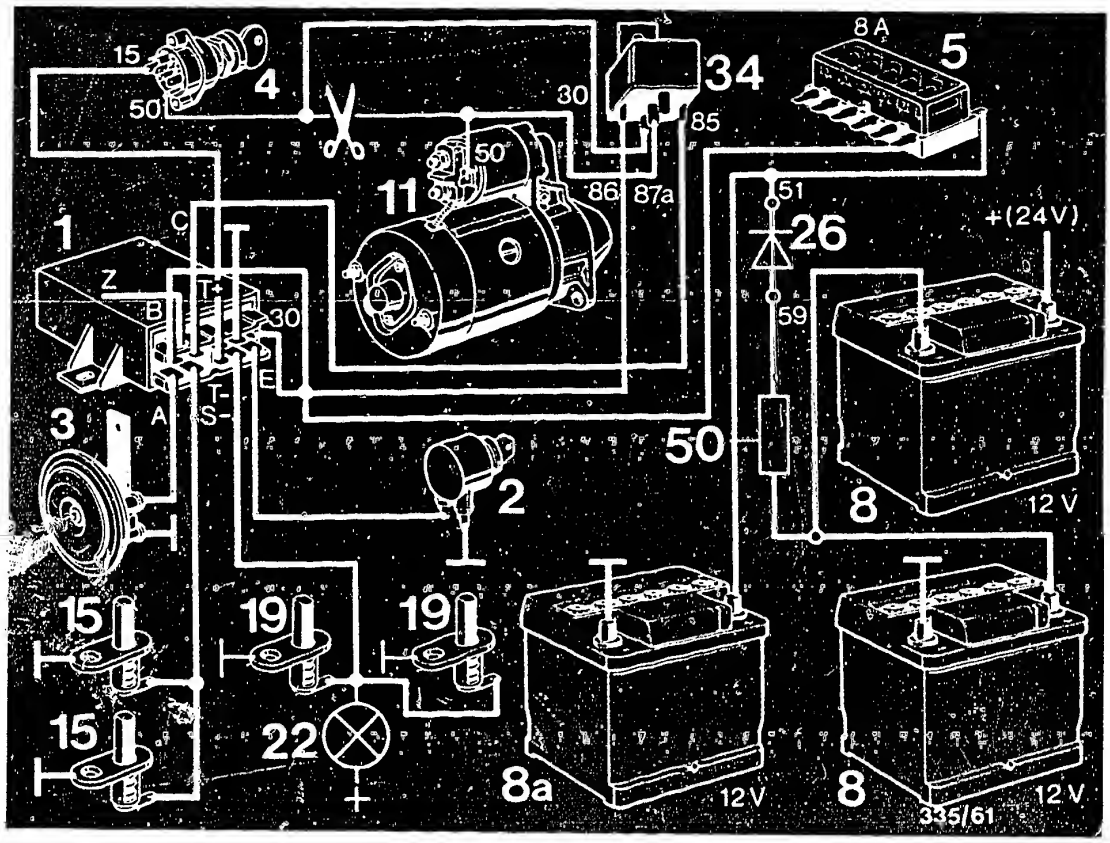
Door contact switches negative. Circuit does not apply to vehicles with electronic ignition system or Motronic.



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
8 = Vehicle batteries 24 V
11 = Starting motor
15 = Contact switch for engine hood/luggage compartment
19 = Door contacts
22 = Interior lamp
34 = Relay (12 V, change-over contact, here as normally-closed contact)

4.2.8 Basic circuit with starting motor immobilization (Car Alarm II)

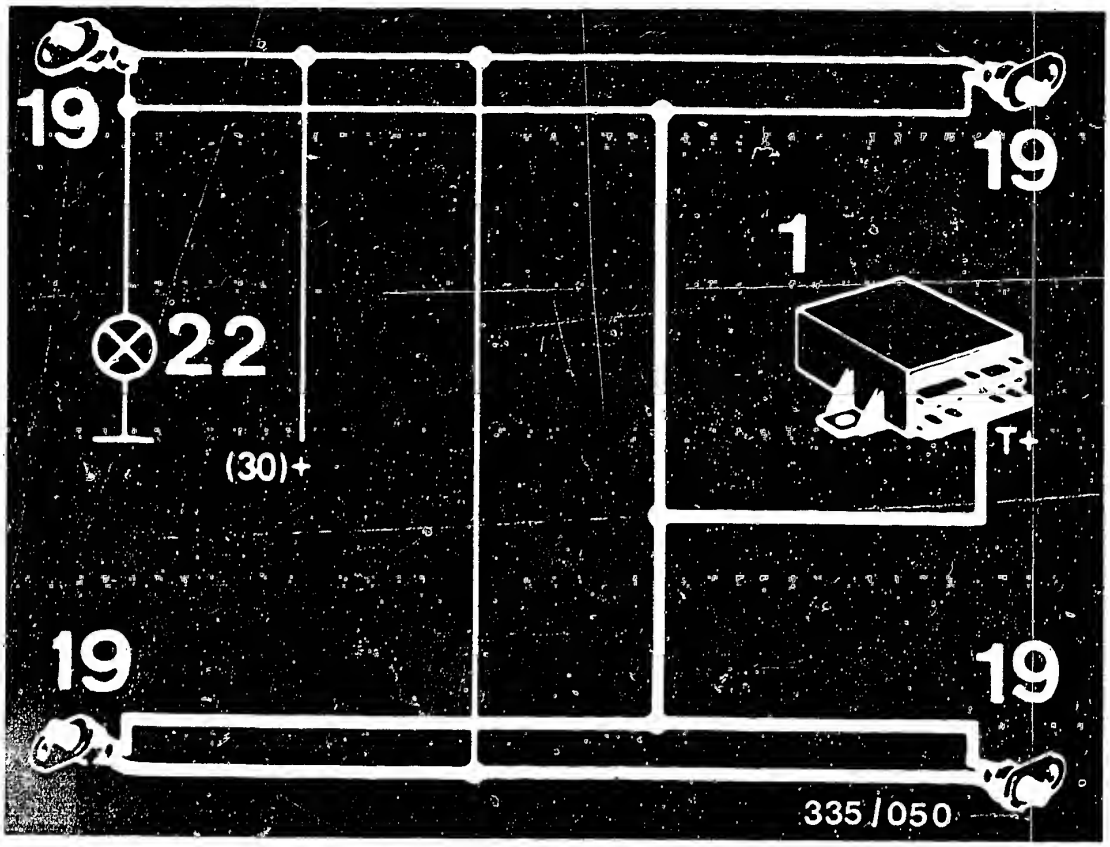
For vehicles with 24 V without separate alarm battery. Negative to ground.



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting switch
5 = Fuse box
(8 A fuse)
8 = Vehicle batteries 24 V
8a = Alarm battery 12 V
e.g. 0 190 051 612
11 = Starting motor
15 = Contact switch for engine hood/luggage compartment
19 = Door contacts
22 = Interior lamp
26 = Diode
34 = Relay
(12 V, changer-over contact, here as normally-closed contact)
50 = Series resistor

4.2.9 Basic circuit with starting motor immobilization (Car Alarm II)

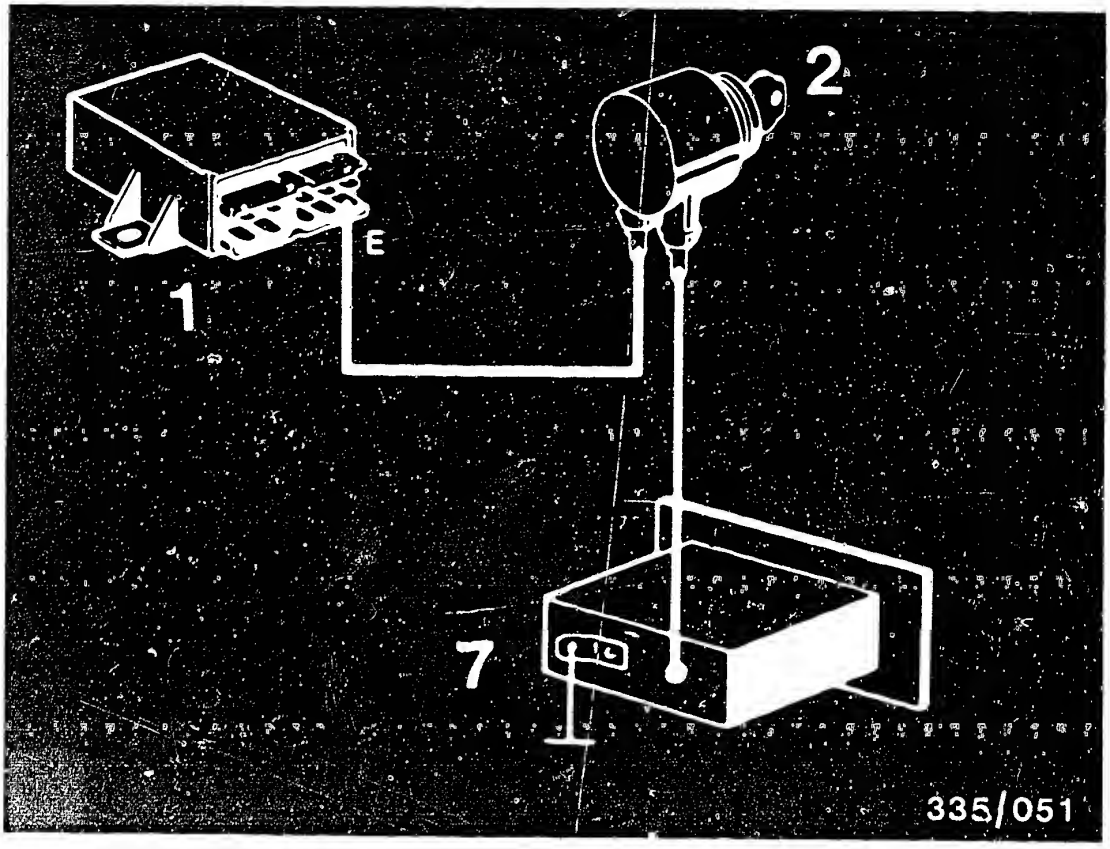
For vehicles with 24 V and additional alarm battery. Negative to ground.



1 = Alarm relay
19 = Door contact switch
22 = Interior lamp

4.2.10 Auxiliary circuit for Car Alarm II

Additional rear door contacts ("positive-switched").



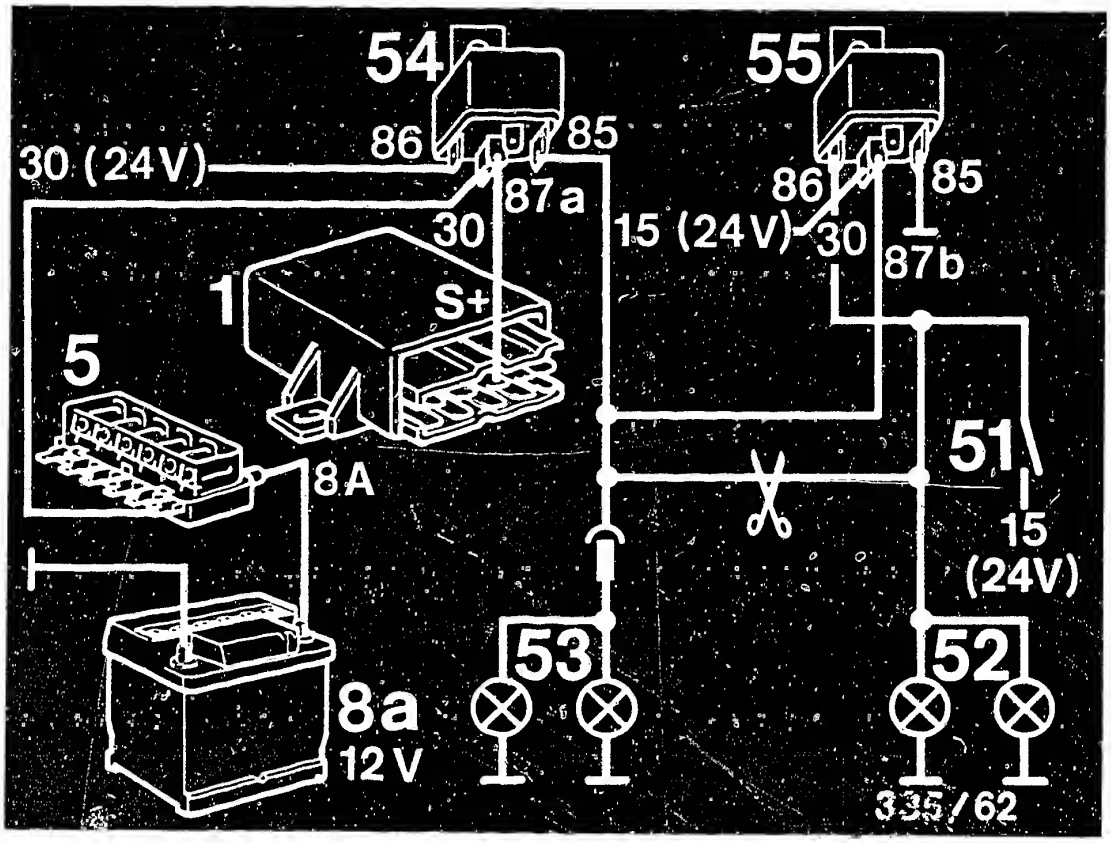
1 = Alarm relay
2 = Alarm switch
7 = Car radio

4.2.11 Auxiliary circuit for Car Alarm II

Protection of car radio.

Note:

Radio protection also functions with alarm system off.

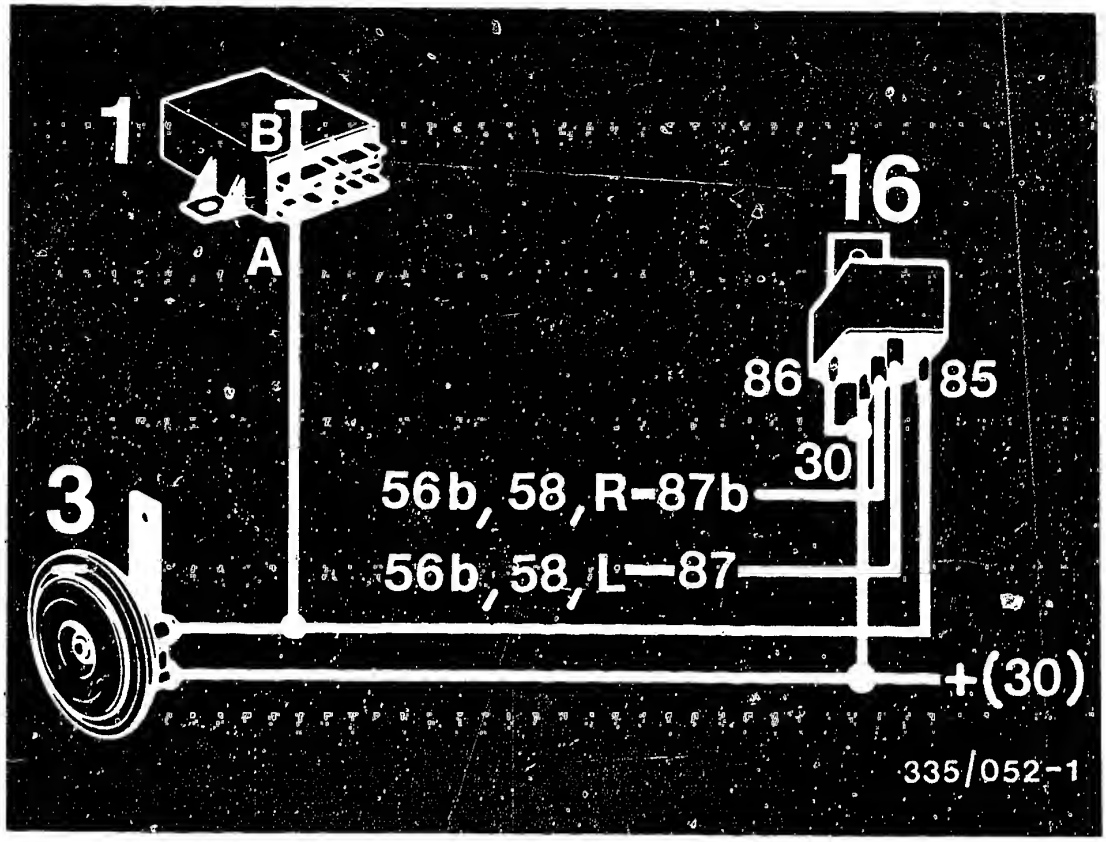


1 = Alarm relay
5 = Fuse box (8 A fuse)
8a = Alarm battery 12 V (e.g. 0 180 051 612)
51 = Stop-lamp switch
52 = Tractor stop lamps
53 = Trailer stop lamps
54 = Relay (24 V, change-over contact, here as normally-closed contact)
55 = Relay (24 V, normally-open contact)

4.2.12 Auxiliary circuit for Car Alarm II

Trailer protection for vehicles with 24 V and separate alarm battery.

Negative to ground.



1 = Alarm relay
3 = Alarm horn

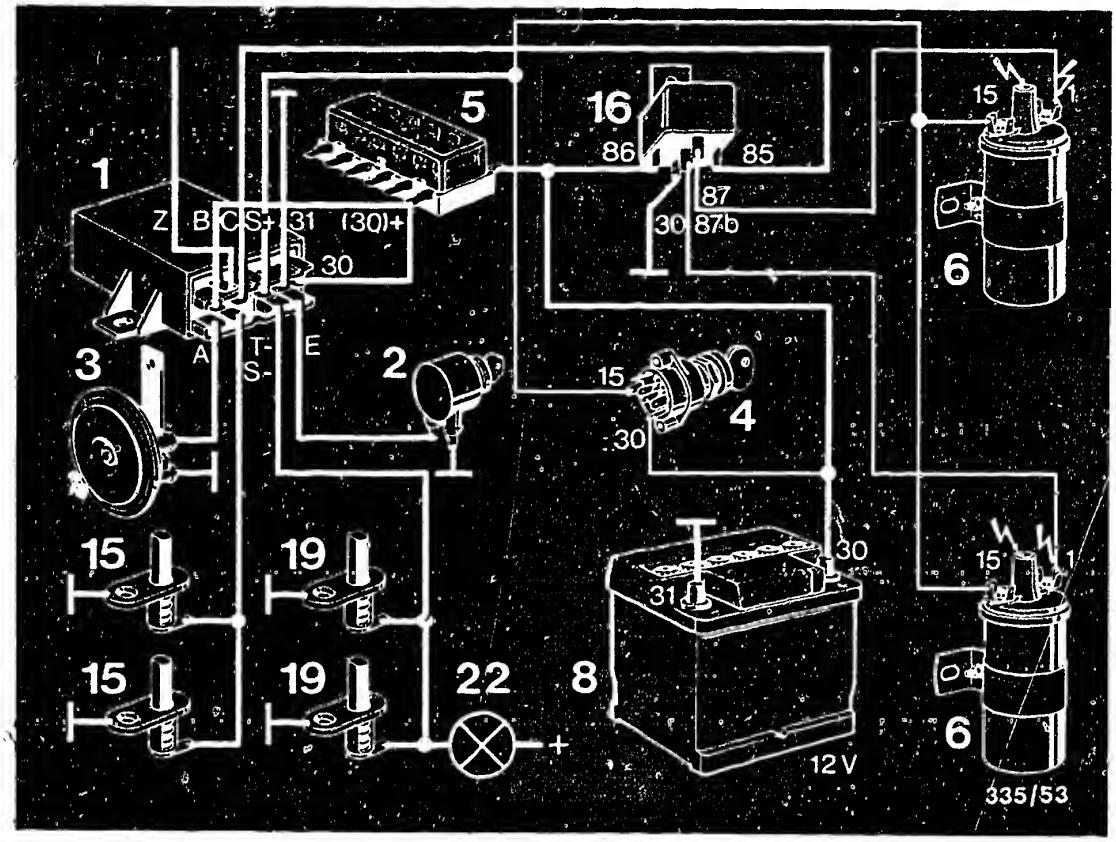
16 = Auxiliary relay (12 V, twin normally-open contact)

4.2.13 Auxiliary circuit for Car Alarm II

Additional visual alarm via auxiliary relay (16).

Note:

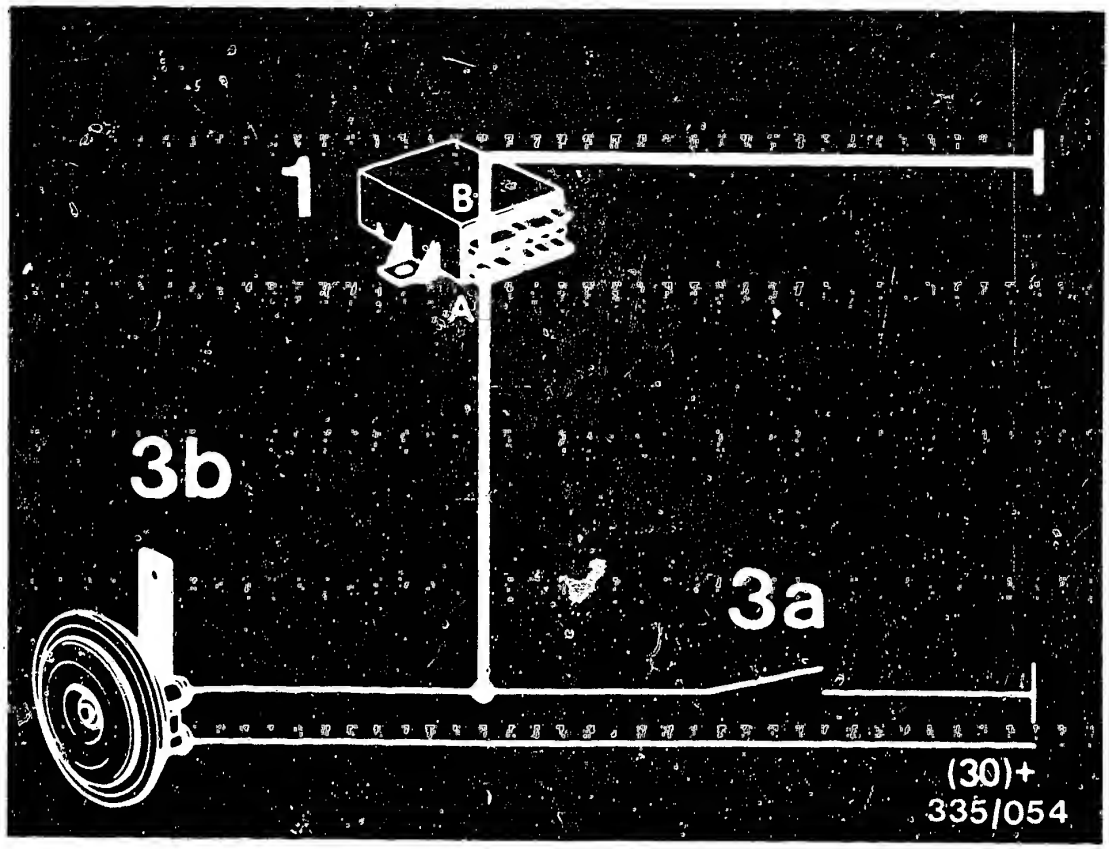
Not allowed in the Federal Republic of Germany.



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition/starting (driving) switch
5 = Fuse box (8 A fuse)
6 = Ignition coils
8 = Battery
15 = Contact switches for engine hood/luggage compartment
16 = Relay (12 V, twin normally-open contact)
19 = Door contact switches
22 = Interior lamp

4.2.14 Special circuit for Car Alarm II

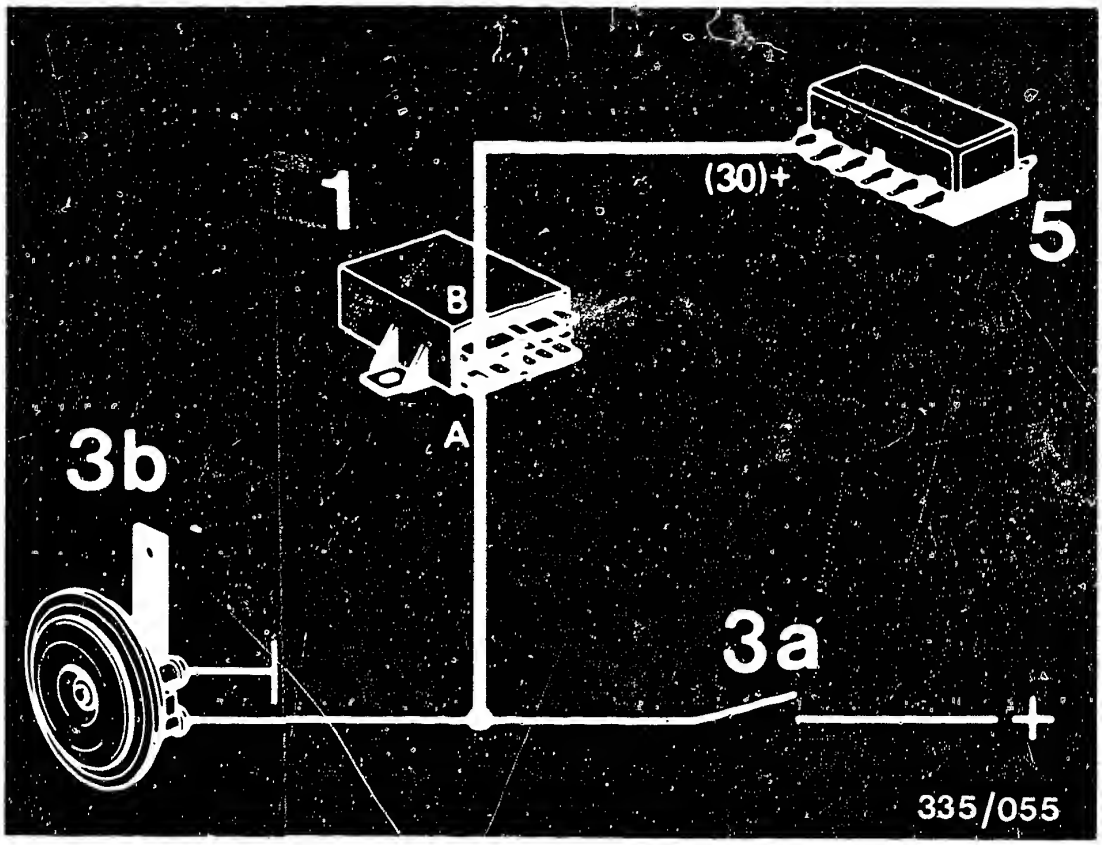
Peugeot 604 with double contact breaker and Car Alarm II.



1 = Alarm relay
3a = Switch for standard horn
3b = Standard horn

4.2.15 Special circuit for Car Alarm II

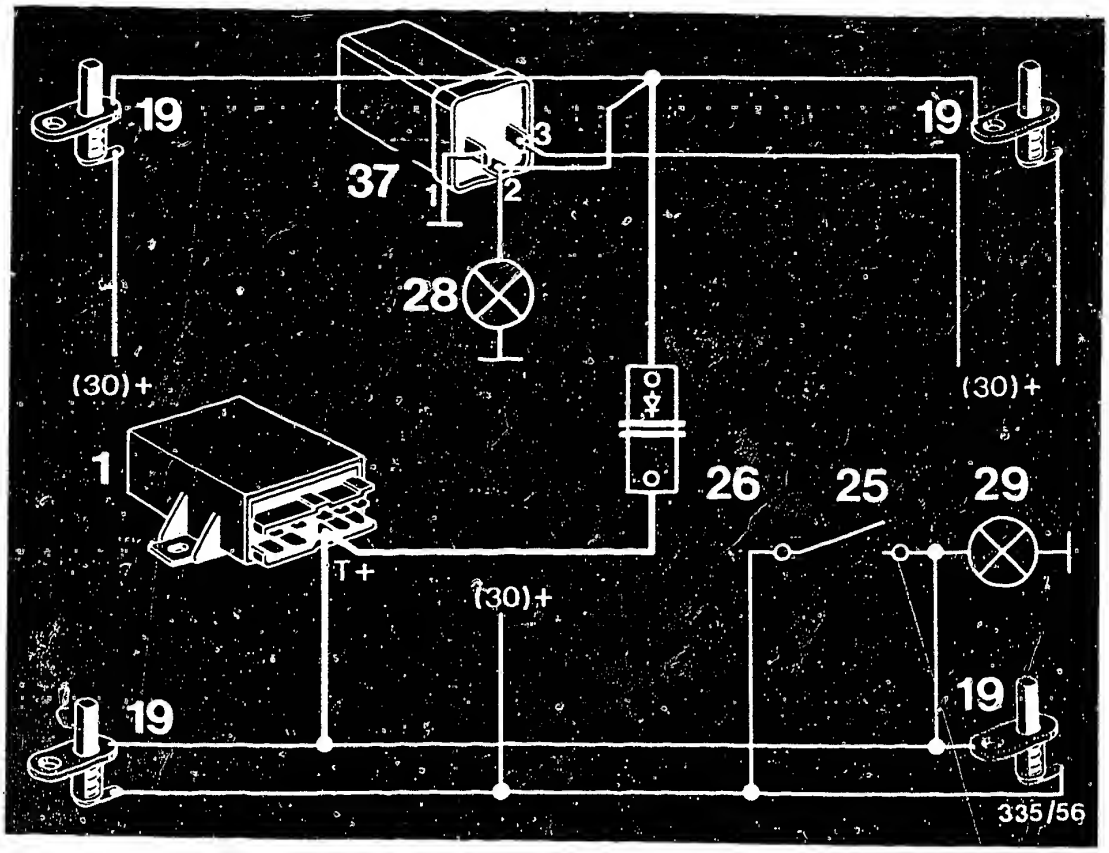
Circuit with standard horn, horn switch switches "negative".



1 = Alarm relay
3a = Switch for standard horn
3b = Standard horn
5 = Fuse box (8 A fuse)

4.2.16 Special circuit for Car Alarm II

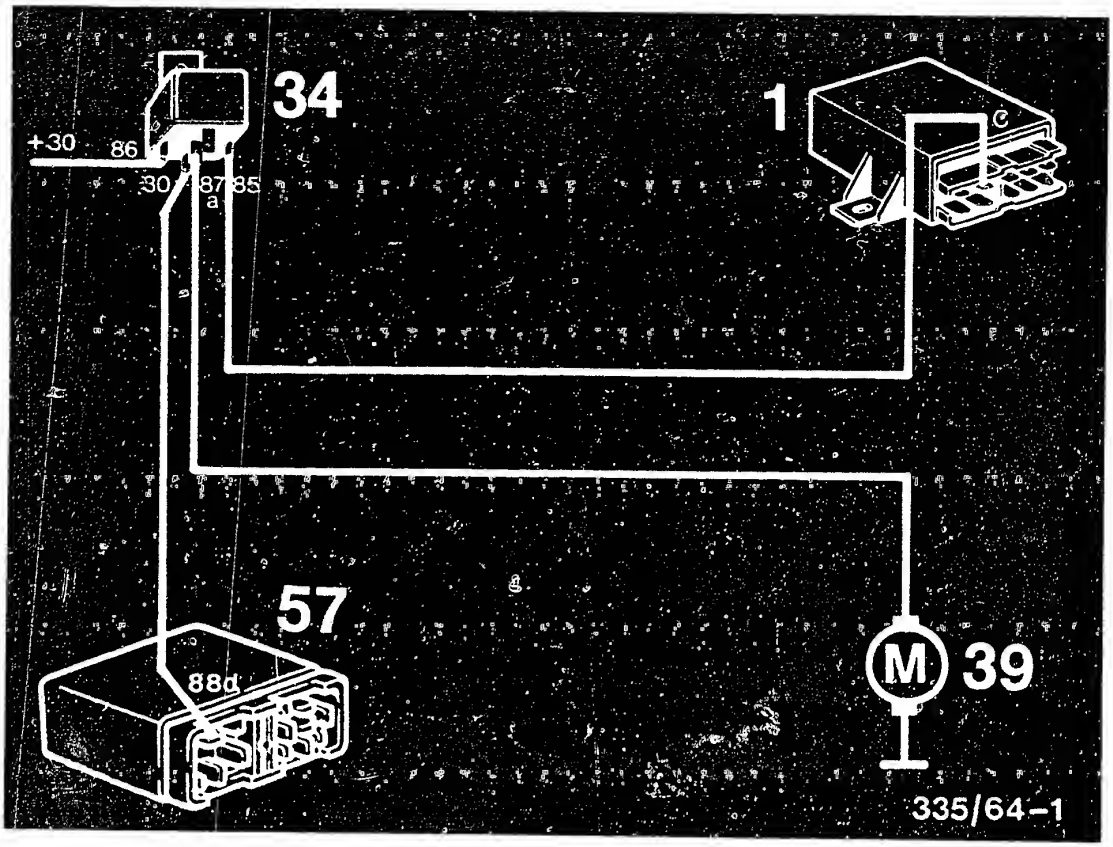
Circuit with standard horn, horn switch switches "positive".



1 = Alarm relay
19 = Door contact switch
25 = Manually-operated switch for rear interior lamp
26 = Blocking diode
28 = Front interior lamp with switch
29 = Rear interior lamp
37 = Time-delay relay

4.2.17 Special circuit for Car Alarm II

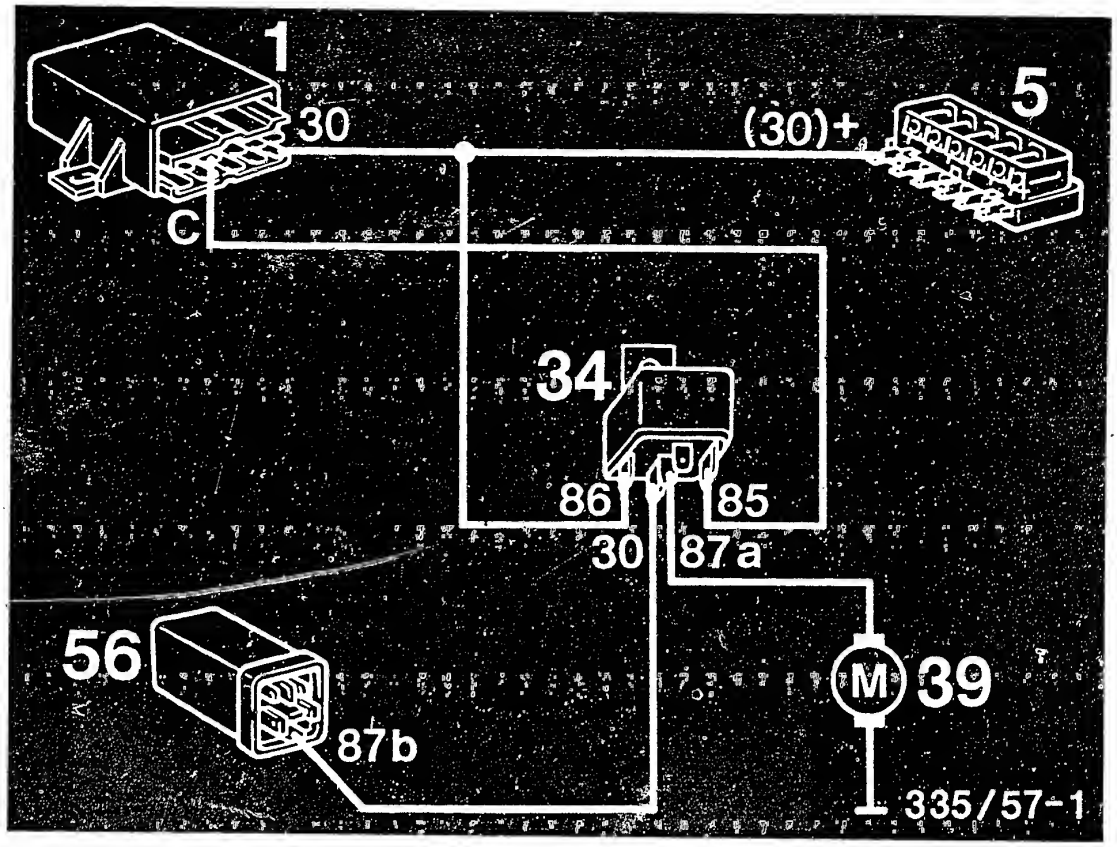
Circuit for Mercedes Benz passenger cars with front and rear interior lamps.



1 = Alarm relay
34 = Auxiliary relay (12 V change-over contact, here as normally-closed contact)
39 = Electric fuel pump
57 = Relay set

4.2.18 Special circuit for Car Alarm II

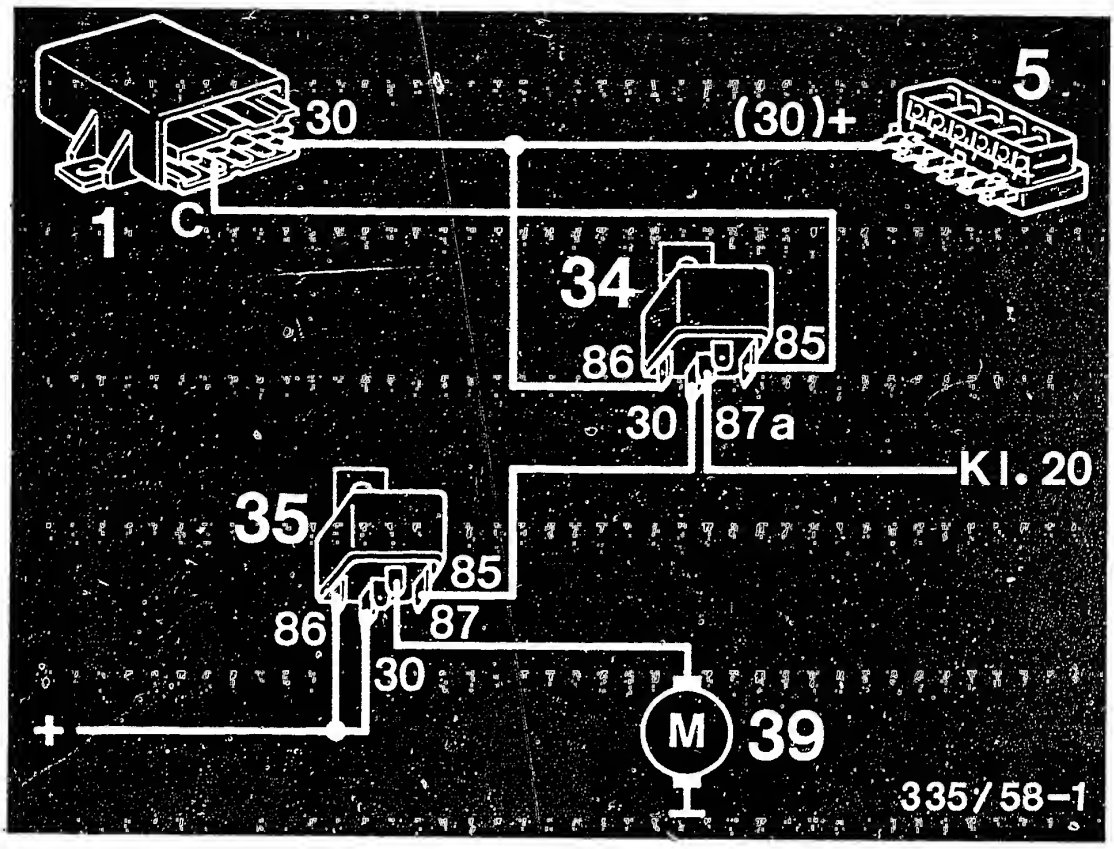
For vehicles with L-Jetronic, cutting off of electric fuel pump.



1 = Alarm relay
5 = Fuse box (8 A fuse)
34 = Auxiliary relay (12 V, change-over contact, here as normally-closed contact)
39 = Electric fuel pump
56 = L-Jetronic (version LE) control relay

4.2.19 Special circuit for Car Alarm II

For vehicles with L-Jetronic (version LE), cutting off of electric fuel pump.



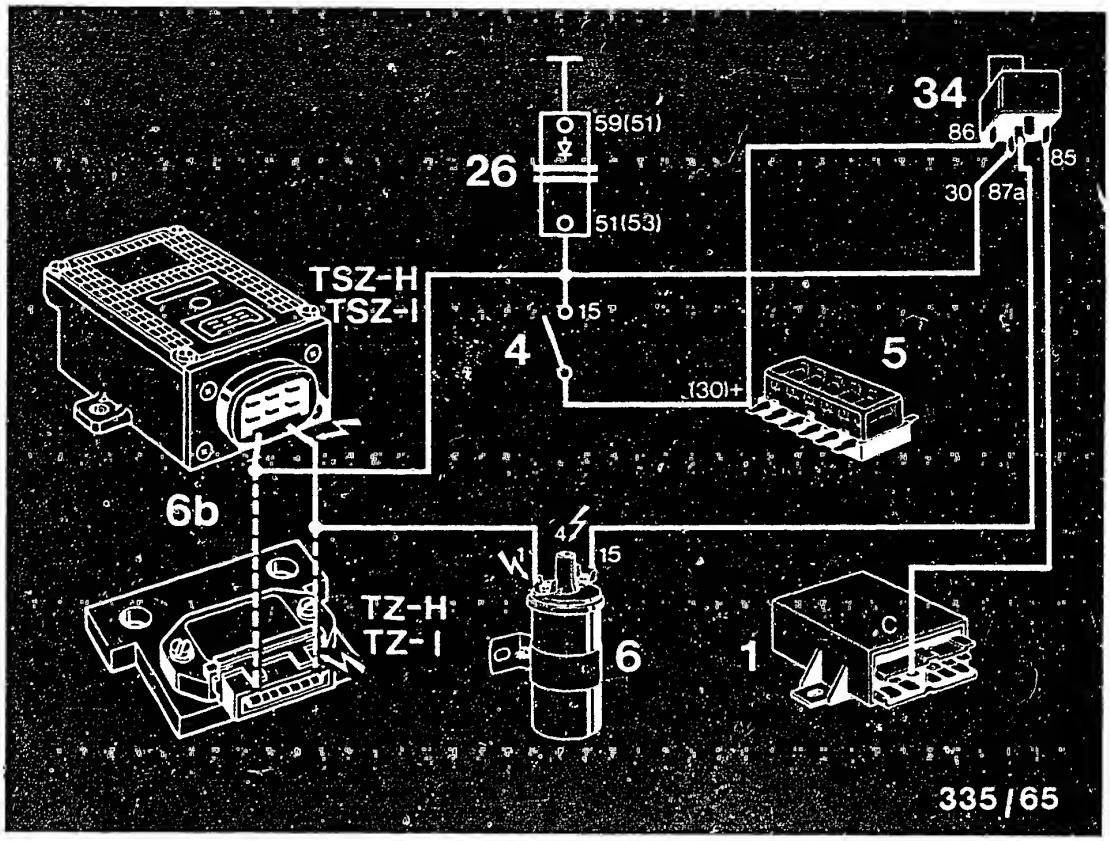
1 = Alarm relay
5 = Fuse box (8 A fuse)
34 = Auxiliary relay (12 V, change-over contact, here as normally-closed contact)
35 = Electric fuel pump relay
39 = Electric fuel pump

Kl. 20 = Lead to terminal 20 on Motronic control unit

4.2.20 Special circuit for Car Alarm II

For vehicles with Motronic, cutting off of electric fuel pump.

Note: Since there are now also Motronic vehicles with twin relays, it is no longer the positive lead to the fuel pump, but lead 20 from Motronic control unit to fuel pump relay that is open-circuited in the case of alarm.

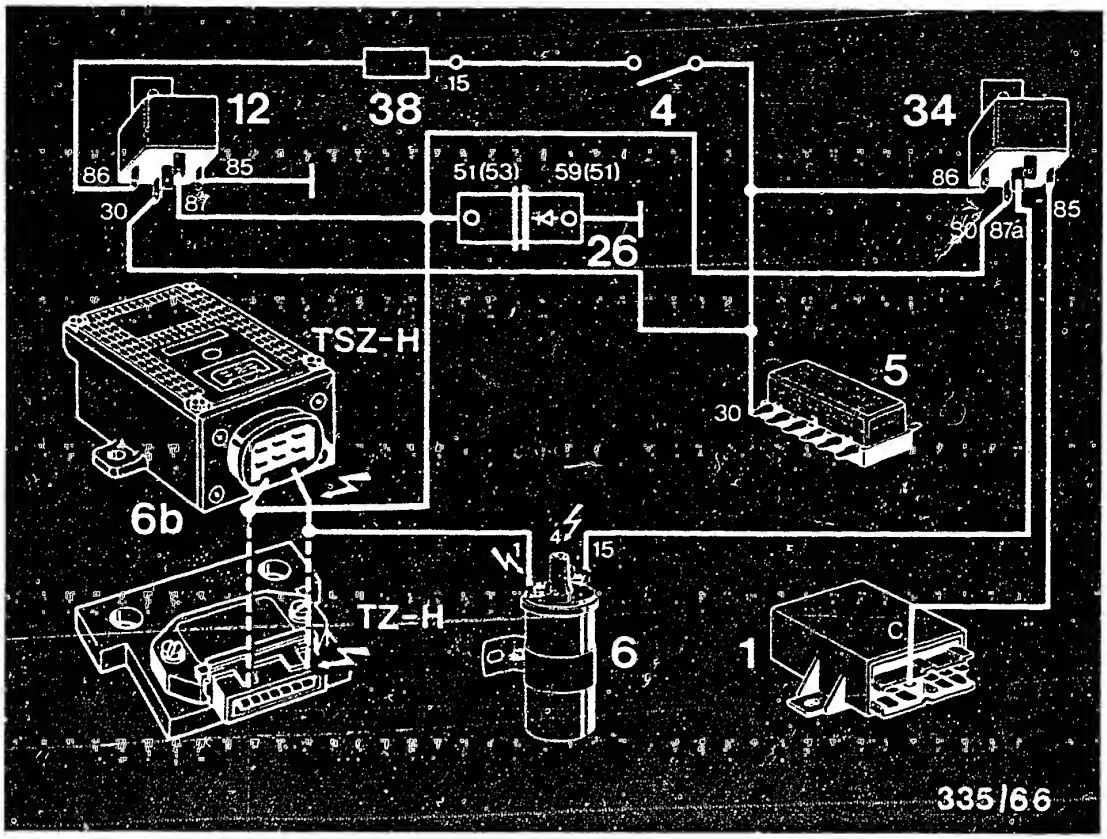


1 = Alarm relay
4 = Ignition and starting switch
6b = Trigger box TSZ-H/TZ-H, TSZ-I/TZ-I
26 = Damping diode (e.g. 0 212 911 001)
34 = Additional relay (12 V change-over contact break-before-make, here normally-closed contact)

4.2.21 Special circuitry for Car Alarm II (continued)

● Subsequently installed TSZ-H,
when resistance cable already in vehicle between the ignition and starting switch and the ignition coil term. 15 has been replaced with a new cable (1.5 mm2).

Note:
The terminal designations of the damping diode (26) has been changed as of date of manufacture 832 (see illustration). The old designations are in parentheses.



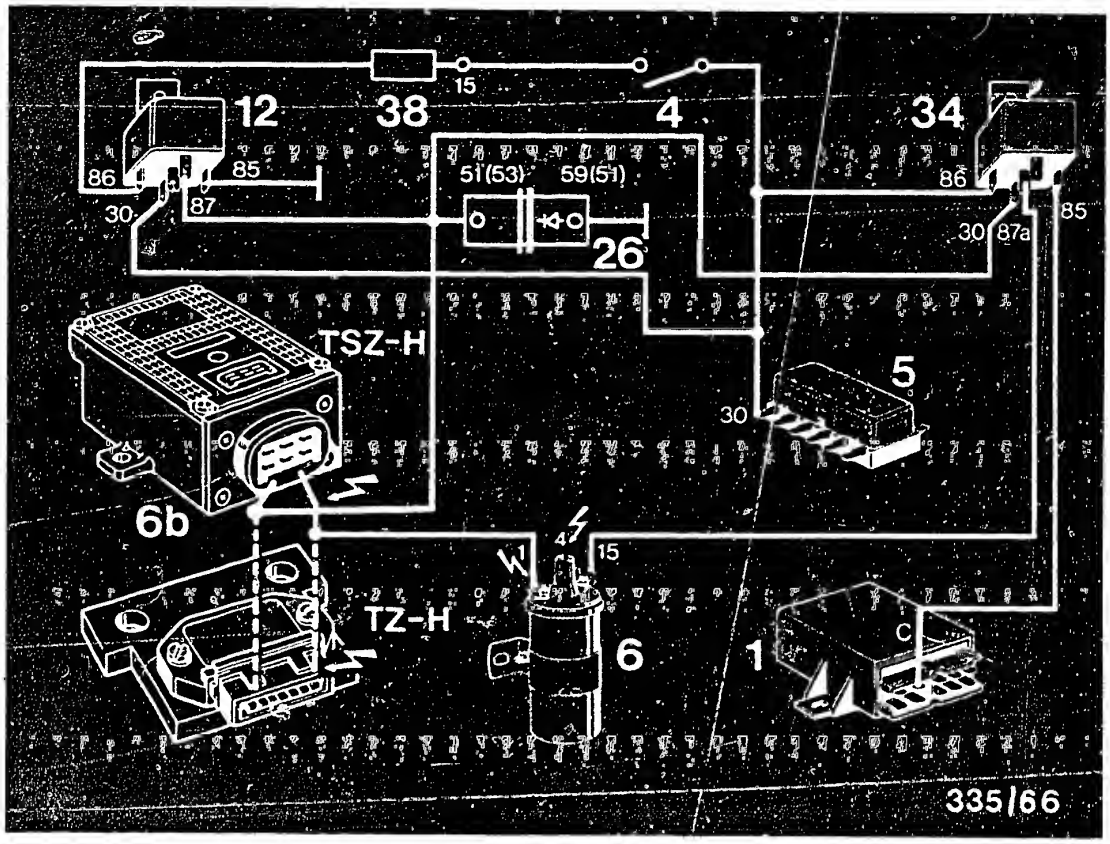
1 = Alarm relay
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
6b = Trigger box (TSZ-H/TZ-H, TSZ-I/TZ-I)
12 = Relay (12 V, change-over contact, here as normally-open contact)
26 = Protective diode (e.g. 0 212 911 001)
34 = Auxiliary relay (12 V, change-over contact, here as normally-closed contact)
38 = Resistance cable (in vehicle wiring harness)

4.2.22 Special circuit for Car Alarm II

For vehicles with:

- Subsequently installed TSZ-H, TZ-H,

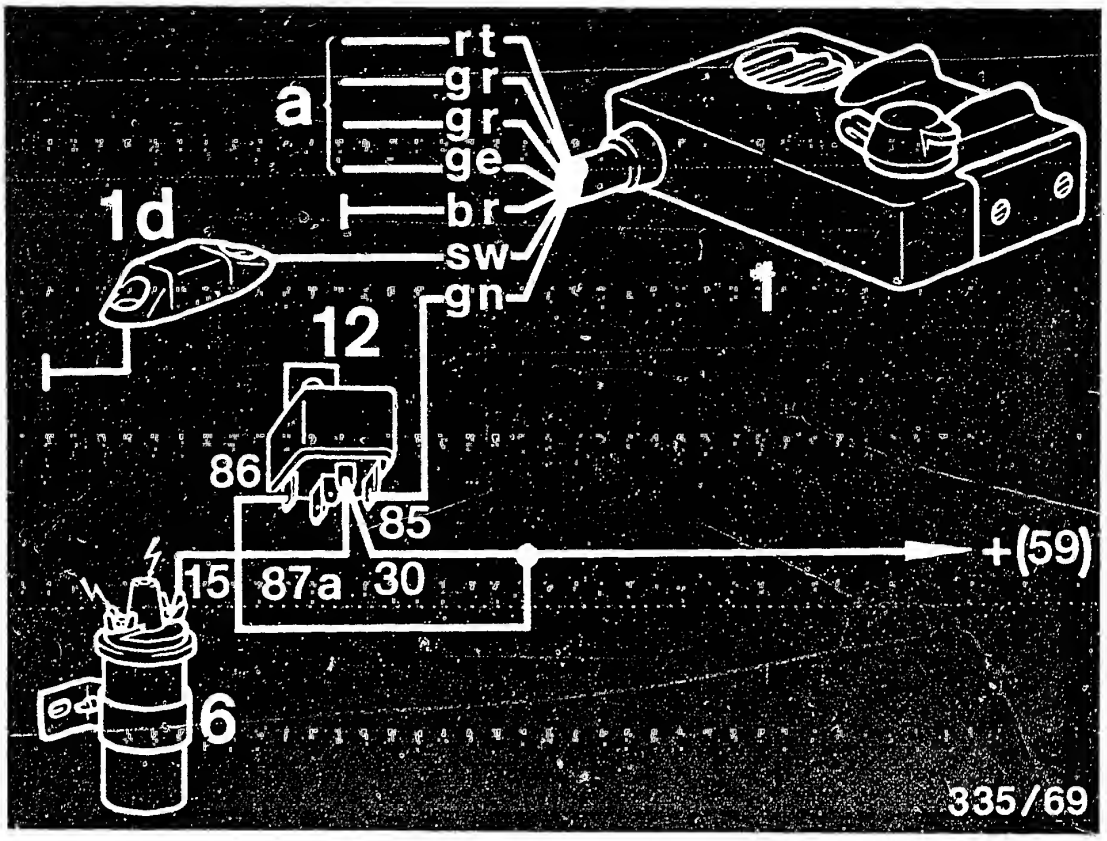
where the resistance cable (38) in the vehicle was left in place and a relay (12) is installed for controlling the positive current to TSZ/TZ trigger box (6b) and ignition coil (6).



1 = Alarm relay
5 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
6b = Trigger box (TSZ-H/TZ-H, TSZ-I/TZ-I)
12 = Relay (12 V, change-over contact, here as normally-open contact)
26 = Protective diode (e.g. 0 212 911 001)
34 = Auxiliary relay (12 V, change-over contact, here as normally-closed contact)
38 = Resistance cable (in vehicle wiring harness)

Special circuit for Car Alarm II (continued)

Note:
As of date of manufacture 832, the terminal designations on the protective diode (26) have been changed (see picture). Old designations in parentheses.



rt = red
br = brown
gr = gray
sw = black
gn = green
ge = yellow

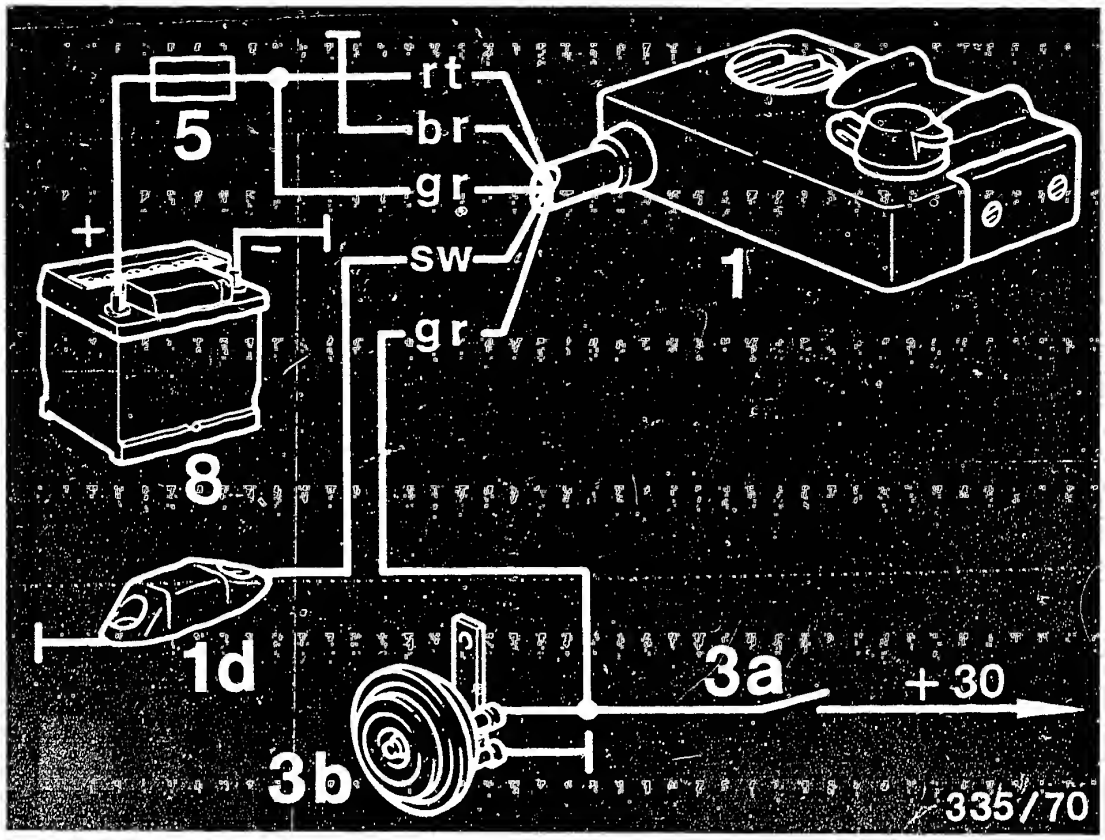
a = leads are not connected.

1 = Alarm relay
1d = Sensor
6 = Ignition coil
12 = Relay (12 V, change-over contact, here as normally-closed contact)

4.3 Circuit diagrams - Two-wheeled vehicle alarm

4.3.1 Basic circuit with ignition immobilization for vehicle without battery

"Positive" lead (59) to ignition coil is open-circuited by auxiliary relay.

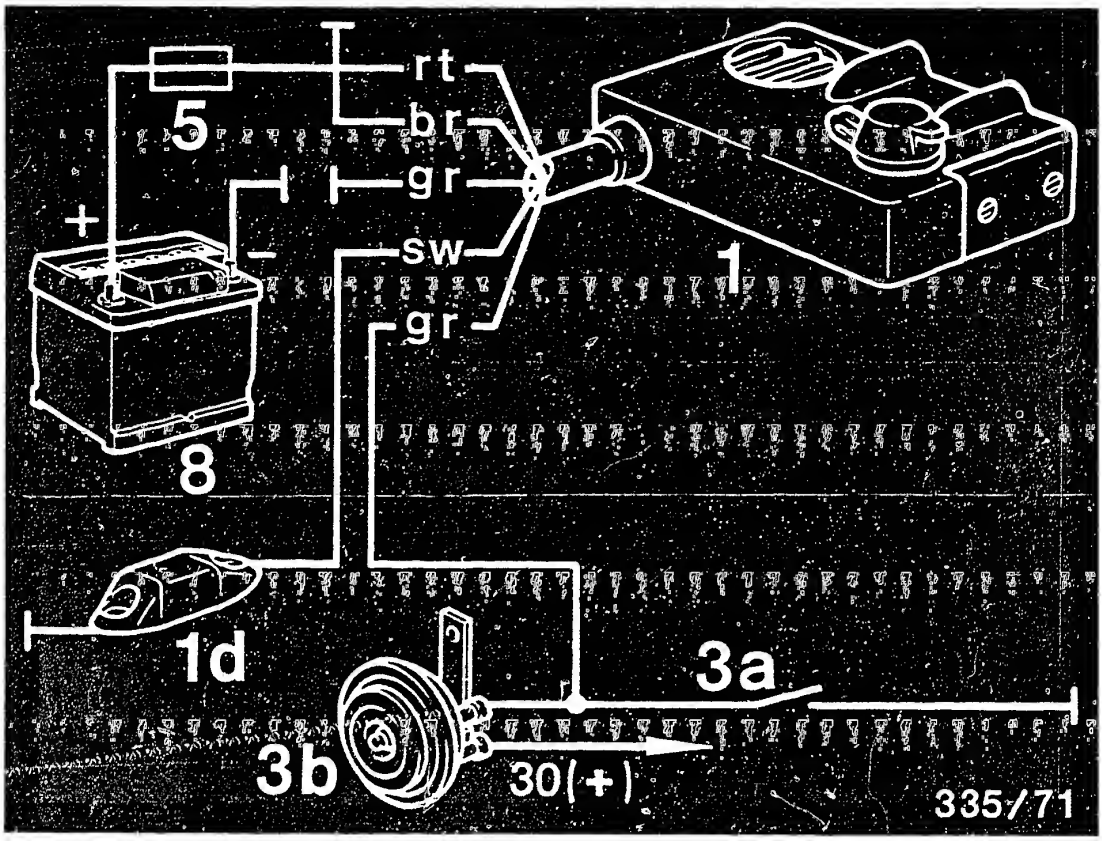


1 = Alarm relay
1d = Sensor
3a = Switch for standard horn
Fuse (8 A)
3b = Standard horn
5 = Fuse (8 A)
8 = Battery

rt = red
br = brown
gr = gray
sw = black

4.3.2 Basic circuit with standard horn (two-wheeled vehicle alarm)
Horn switch switches "positive"

Caution: Fasten brown lead not directly on battery -, but on vehicle frame.

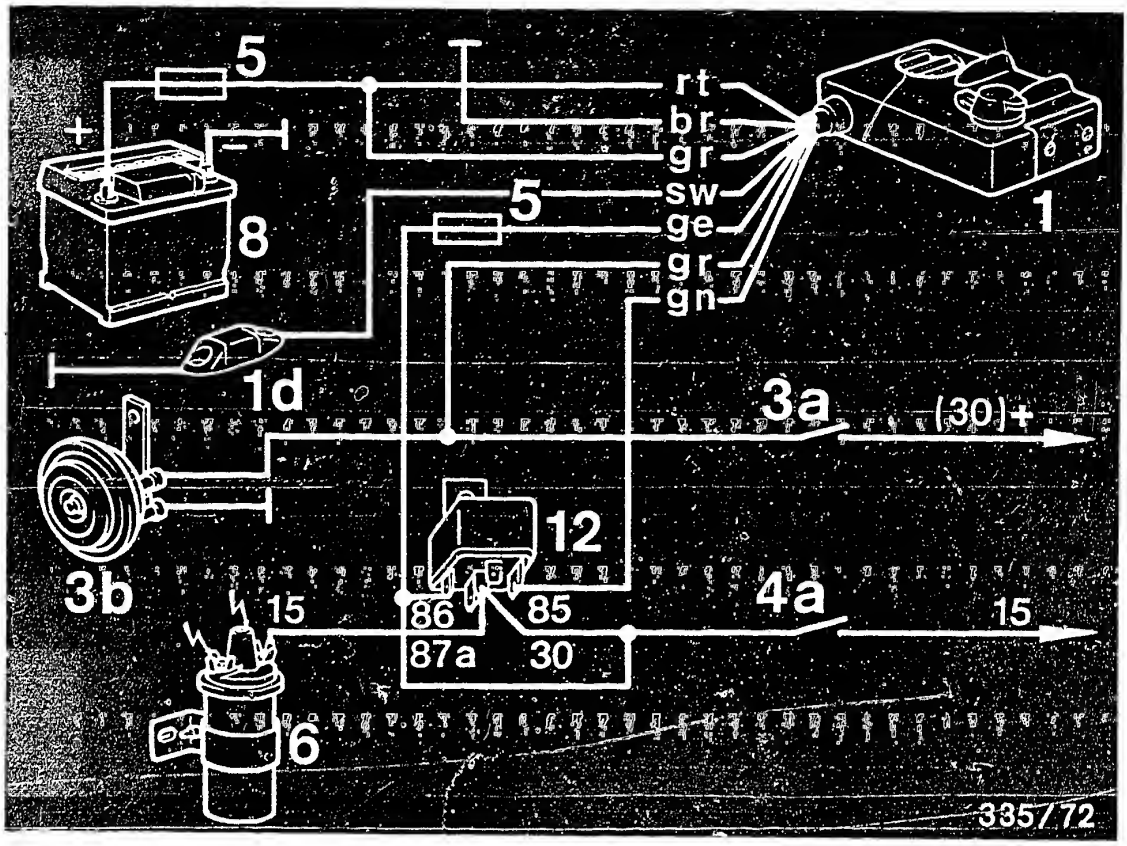


1 = Alarm relay
1d = Sensor
3a = Switch for standard horn
Fuse (8A)
3b = Standard horn
5 = Fuse (8 A)
8 = Battery

rt = red
br = brown
gr = gray
sw = black

4.3.3 Basic circuit with standard horn
(two-wheeled vehicle alarm)
Horn switch switches "negative"

Caution: Do not fasten brown and gray leads directly to battery -, but to vehicle frame.

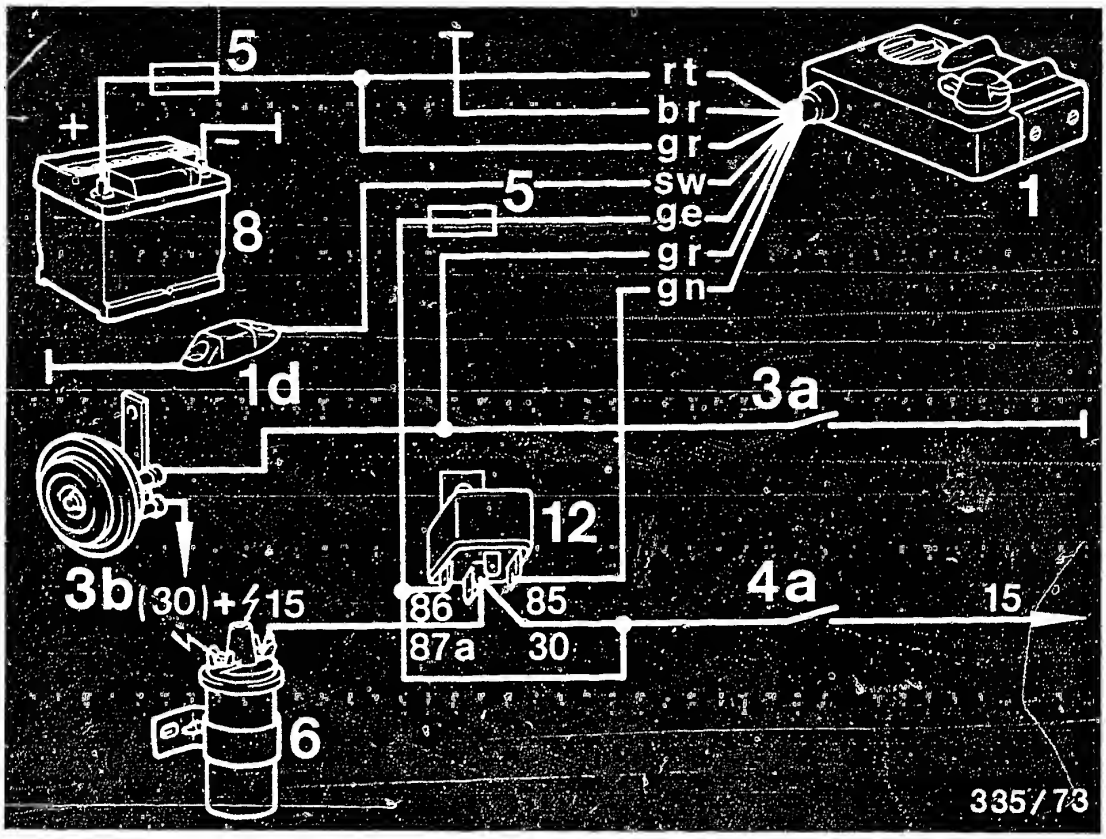


1 = Alarm relay
1d = Sensor
3a = Switch for standard horn
3b = Standard horn
4a = RUN-OFF switch
5 = Fuse (8 A)
6 = Ignition coil
8 = Battery
12 = Relay (12 V, change-over contact, here as normally-closed contact)

br = brown
ge = yellow
gn = green
gr = gray
rt = red
sw = black

4.3.4 Basic circuit with ignition immobilization (two-wheeled vehicle alarm)

Horn switch switches "positive", lead 15 to ignition coil is open-circuited by auxiliary relay.
Note: Do not fasten brown lead directly on battery -, but on vehicle frame.

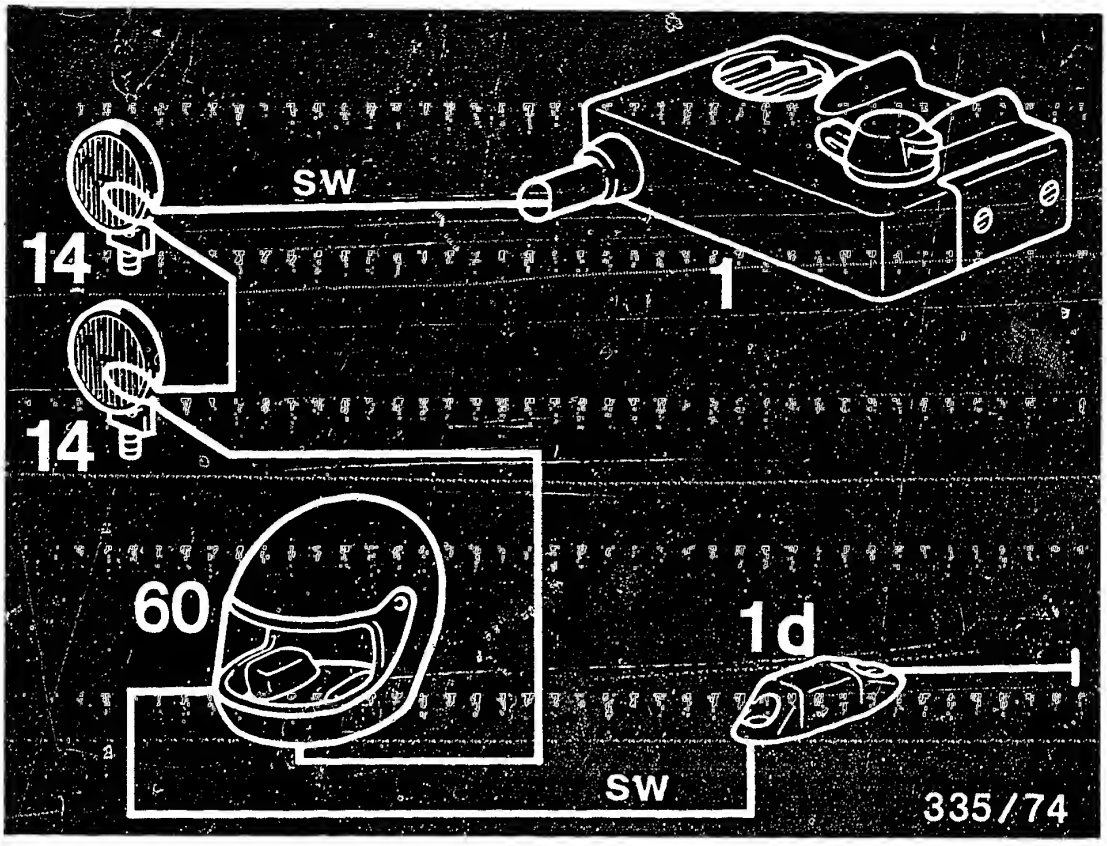


1 = Alarm relay
1a = Sensor
3a = Switch for standard horn
3b = Standard horn
4a = RUN-OFF switch
5 = Fuse (8 A)
6 = Ignition coil
8 = Battery
12 = Relay (12 V, change-over contact here as normally-closed contact)

br = brown
ge = yellow
gn = green
gr = gray
rt = red
sw = black

4.3.5 Basic circuit with ignition immobilization (two-wheeled vehicle alarm)

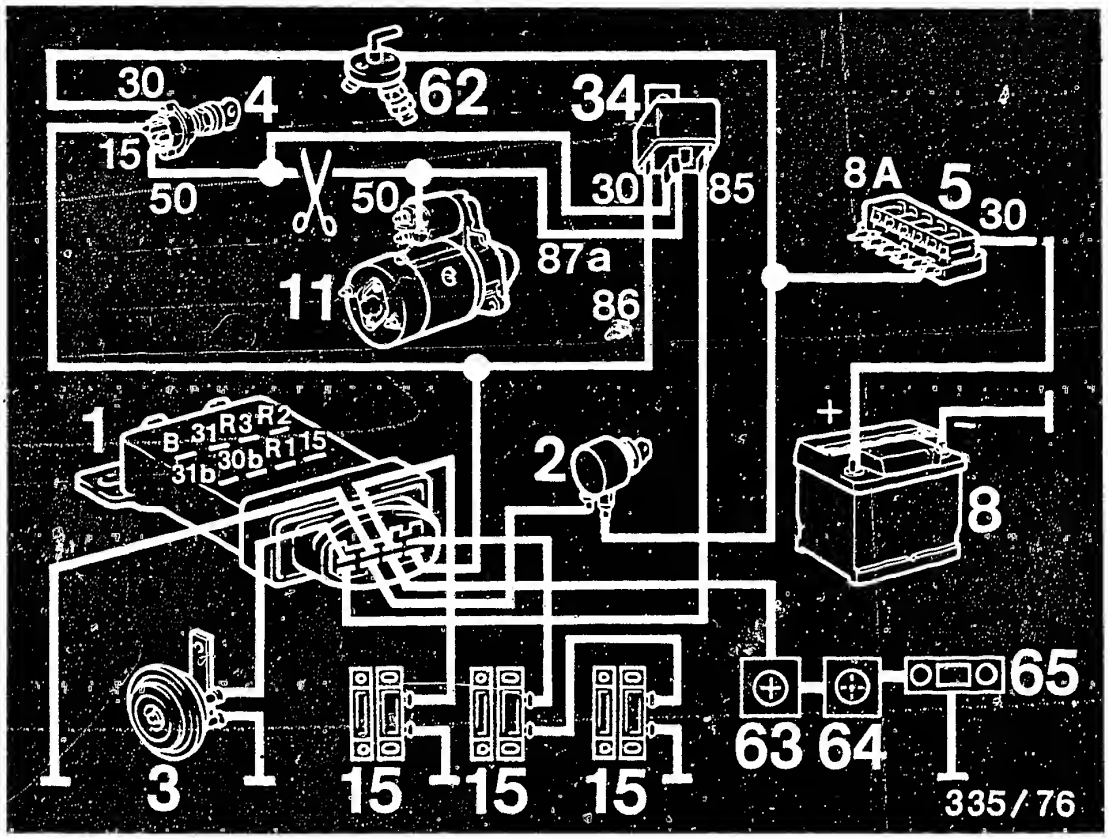
Horn switch switches "negative". Lead 15 to ignition coil is open-circuited by auxiliary relay.
Note: Do not fasten brown and gray leads directly on battery -, but on vehicle frame.



1 = Alarm relay
1d = Sensor
14 = Auxiliary lamp
60 = Helmet

4.3.6 Auxiliary circuit for two-wheeled vehicle alarm

Protection of helmet and auxiliary lamp.



1 = Alarm
2 = Alarm switch
3 = Alarm horn
4 = Ignition and starting switch
5 = Fuse box (8 A fuse)
8 = on-board battery
11 = Starter
15 = Contact switches, e.g. at cabin doors, engine and stowage room hatches, etc.
34 = Start-interrupt relay (12 V change-over contact break-before make, here normally-closed contact)
62 = Battery main switch
63 = Boat compass
64 = Depth sounder
65 = Radio

4.4 Circuit diagram for Boat Alarm system

5. Trouble-shooting

The trouble-shooting procedure is divided into

- Test conditions
- General trouble-shooting
- Trouble-shooting chart (customer complaint)
- Trouble-shooting program (detailed trouble-shooting)

5.1 Test conditions

Check the customer complaint / triggering of alarm.

Switch on (arm) the anti-theft alarm system.
Open and close all doors one after the other.
Open and close engine hood and luggage-compartment lid.
Operate starting motor.
Alarm must sound immediately or after approx. 5 seconds, depending on system.

With Car Alarm Plus 3, also raise vehicle with jack (wheels must not be clear) until alarm sounds.

With Car Alarm Plus 4, disturb 3-dimensional ultrasonic field in passenger compartment by opening door, reaching in through window etc. Alarm must sound immediately or after approx. 5 seconds, depending on system.

With two-wheeled vehicle alarm, raise parking stand.
Alarm must sound immediately.
Open-circuiting of ignition need not be connected.

With the Boat Alarm, wait for a priming period of 20 seconds. Open and close hatches which are to be secured, such as cabin, engine compartment, stowage compartments ..
Activate starting motor.

The alarm will sound approx. 5 sec. after the cabin door is opened.

The alarm must sound immediately when the engine or storage compartment is opened, or when accessories such as radio, depth sounder, or compass are removed.

When ignition is switched on, the alarm should sound immediately, with the starting motor being blocked.

If one of these actions fails to initiate an alarm, or if it is possible to start the engine, the alarm system is defective.

5.2 General trouble-shooting

Car alarm systems, two-wheeled vehicle alarm systems or boat alarm systems are switched off (deprimed). Check the entire systems circuitry for proper connection and good contact, eliminating any defects.

Disconnect the alarm horn connected to the alarm system and connect directly to B + and ground for testing. Replace alarm horn, if defective.

Voltage test with Car Alarm I at terminal 30b of alarm relay (not in case of negative-switched systems).
Voltage should be = battery voltage

Voltage test with Car Alarm II at terminal 30 of alarm relay (not in case of negative-switched systems)
voltage should be = battery voltage

Voltage test with two-wheeled vehicle alarm at red or brown lead of alarm relay wiring harness
voltage should be = battery voltage

Voltage test for Boat Alarm at alarm relay term. 30
Nominal voltage: battery voltage

With Car Alarm II only

Alarm switch not connected.
Voltage test at alarm relay between terminal E and vehicle ground.
Voltage should be ≧ 12 V
otherwise alarm relay defective.

Alarm switch connected and on. Voltage test at alarm switch at lead coming from terminal E of alarm relay.
Voltage should be = 3.5... 4.5 V

Alarm switch connected, but off. Voltage test at alarm switch at lead coming from terminal E of alarm relay.
Voltage should be = 5.5 ... 6.5 V

24 V systems (Car Alarm II only)

In vehicles with battery main switch, the vehicle battery must not be disconnected since otherwise protection of the trailer is not guaranteed.

When, with the alarm system on, the vehicle battery is disconnected, the alarm sounds.

Two-wheeled vehicle alarm

When, with the alarm system on, the vehicle battery is disconnected, the alarm sounds immediately via the built-in buzzer since alarm relay is supplied internally from 9 V battery.

Special note

If the car radio is also protected against theft, the ground lead of the alarm switch is routed to ground via the car radio.

If the car radio is removed, the free lead from the alarm switch must be grounded.

For simultaneous accessory-theft protection in the Boat Alarm, a ground cable is looped from term. R1 to the alarm relay via the consuming devices.

If one of the inputs R1, R2, or R3 on the alarm relay in the boat alarm is not assigned, this input must not be connected to ground for testing.

When removing the car radio, the freed cable leading to the alarm switch must be connected to ground.

5.3 Trouble-shooting chart

Customer complaint (fault symptoms)

The fault symptoms listed below may be due to one or more faults.

1. False alarm with Car Alarm I, II, two-wheeled vehicle alarm, after installation with system armed.	2. False alarm with Car Alarm I, II, two-wheeled vehicle alarm, after the system has worked correctly for some time.	3. No alarm with Car Alarm I, alarm switch on.	Cause of trouble	Coordinates
●			Incorrect wiring when installing the system. Door contacts must not be connected to terminal S and R. (No additional contacts for two-wheeled vehicle alarm).	D 19
●			Contact switches of hood and luggage-compartment lid are not connected to terminal S. (No additional contacts for two-wheeled vehicle)	D 19
●	●		Positive- or negative-switched fan motor incorrectly wired. Not with 2-wheeled vehicle alarm	D 21
	●	●	Loose contact in ground lead of an electrical device which is routed via terminal R of alarm relay.	E 1
	●	●	Short circuit/short circuit to ground between leads.	E 1
●			Sensor incorrectly connected, lead pointing downward. Only in case of two-wheeled vehicle.	E 15
●			Vehicle battery not connected. Two-wheeled vehicle only.	E 15
	●		Loose contact in sensor lead. Two-wheeled vehicle only.	E 15

Trouble-shooting chart (continued)

Customer complaint (fault symptoms)

The fault symptoms listed below may be due to one or more faults.

3. No alarm with Car Alarm I, alarm switch on.	4. False alarm with Car Alarm II, alarm switch off.	5. False alarm with Car Alarm II, alarm switch on.	Cause of trouble	Coordinates
●			Interior lamp not lit: switch, leads, fuse defective.	E 3
●			Interior lamp lit: open circuit in power supply to alarm relay, alarm relay, alarm switch or alarm horn defective	E 3
●			If engine compartment or luggage compartment lighting O.K., fault at alarm relay or lead.	E 3
●		●	Short circuit or short circuit to ground in switch or lead to switched-on device	E 5
		●	Short circuit in alarm relay between terminals A and B	E 7

Trouble-shooting chart (continued)

Customer complaint (fault symptoms)

The fault symptoms listed below may be due to one or more faults.

4. False alarm with Car Alarm II. Alarm switch off.	5. False alarm with Car Alarm II. Alarm switch on.	6. No triggering of alarm with Car Alarm II. Alarm switch on.	Cause of trouble	Coordinates
●	●		Alarm switch defective: Internal resistance 0 Ω or connector dropped off.	E 7
●	●		Moisture in alarm switch	E 7
●	●		Open circuit in ground connection of alarm switch	E 7
		●	Corresponding lamp not lit: Switch, lead or fuse defective.	E 9
		●	Corresponding lamp lit: Open circuit in leads to connections of alarm relay S - T + or T -. Connector loose etc., alarm horn or relay defective.	E 9
		●	Open circuit in lead to terminal S +.	E 9
		●	Radio ground lead via alarm switch to terminal E dropped off.	E 9
		●	Alarm relay defective.	E 9

Trouble-shooting chart (continued)

Customer complaint (fault symptoms)

The fault symptoms listed below may be due to one or more faults.

7.	8.	9.	10.	Cause of trouble		Coordinates
●				Plug-in connections on alarm relay or angle sensor dropped off.		E 11
●	●			Evaluation electronics defective.		E 13
	●			Evaluation electronics or ultrasonic detector defective.		E 13
●				Angle sensor defective.		E 11
		●	●	Alarm relay defective.		E 15
		●		No voltage at red lead No ground connection at brown lead	flat battery in alarm relay	E 15
		●		Sensor defective.		E 15

Trouble-shooting chart (continued)

Customer complaint (symptoms of trouble)

The symptoms of trouble listed below can have one or more causes.

11. False alarm with Boat Alarm after installation when system is primed 12. False alarm with Boat Alarm after system has been operating satisfactorily for a time 13. No alarm with Boat Alarm, alarm switched on				
			Cause of trouble	Coordinates
●			Incorrect connection during installation of system.	E 19
	●	●	Defective alarm switch.	E 21, F 1
	●	●	Short circuit or ground connection between leads.	E 21, E 23
		●	No battery voltage at alarm relay.	-
	●	●	Defective alarm relay.	E 21, E 23
●	●		Circuit break in contact switches.	E 19, E 23, F 3
		●	Defective fuse.	E 23
		●	Defective alarm horn or open circuit in lead to horn	-

Trouble-shooting chart (continued)

Customer complaint (symptoms of trouble)

The symptoms of trouble listed below can have one or more causes.

14.	15.	16.	Cause of trouble	Coordinates
●			Defective alarm switch.	F 1
●	●		Alarm relay.	F 1, F 3
	●		Circuit break in contact switches.	F 3
		●	Defective fuse	E 23
		●	Defective start-interrupt relay.	E 23
		●	No battery voltage at alarm relay.	-

5.4 Trouble-shooting program

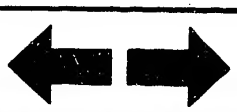
Aim of trouble-shooting program

This program is intended to assist workshop employees to rapidly diagnose causes of trouble in vehicle or boat alarm systems, using the proper test equipment.

Test procedure

The test steps on the left in the trouble-shooting program contain test instructions.

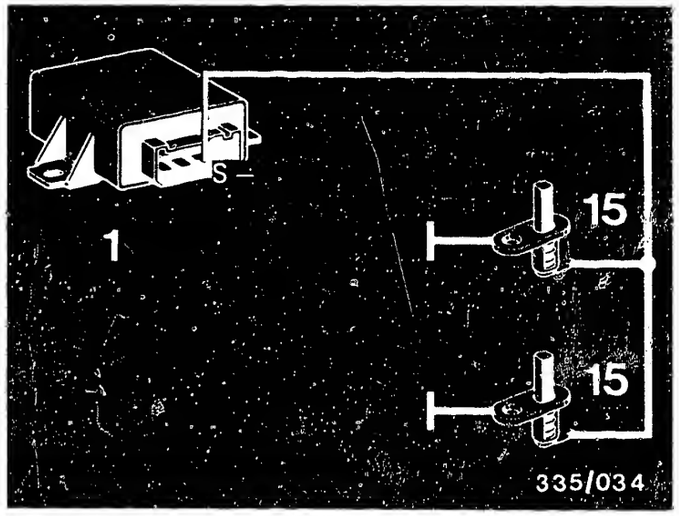
If a fault is found during a test step, proceed according to the repair instructions given in the box on the right.



5.5 Car Alarm I

5.5.1 False alarm with Car Alarm I - immediately after installation - alarm switch on

When door is opened, alarm sounds immediately	Incorrect wiring when installing system or alarm relay defective. Door contacts must not be connected to terminals "S" and "R". Change connections.
When luggage-compartment lid and hood are opened, alarm sounds with a delay of a few seconds	Incorrect wiring when installing the system. Contact switches for hood and luggage-compartment lid are not connected to terminal "S". Make connection. Use contact switches.



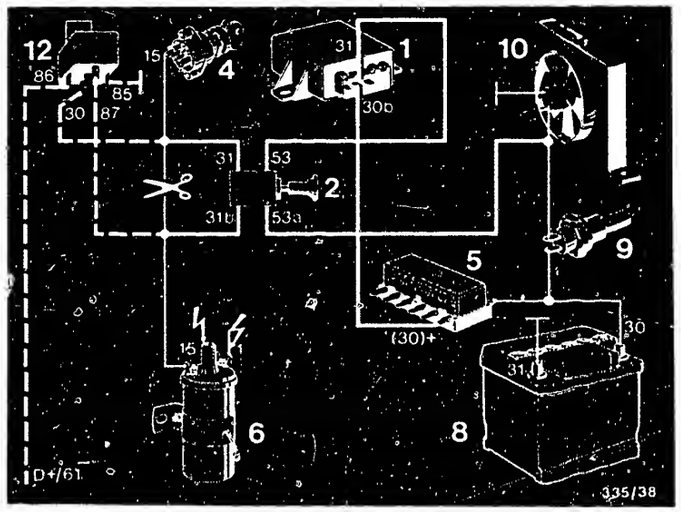
1 = Alarm relay
15 = Contact switches (e.g. for hood and luggage compartment)

5.5.2 False alarm with Car Alarm I after stopping the engine when hot, alarm switch on.

Alarm sounds immediately when fan motor cuts in through thermostat	→ Incorrect wiring when installing system. Caution: + and - switched fan motors. Connect according to circuit diagram.

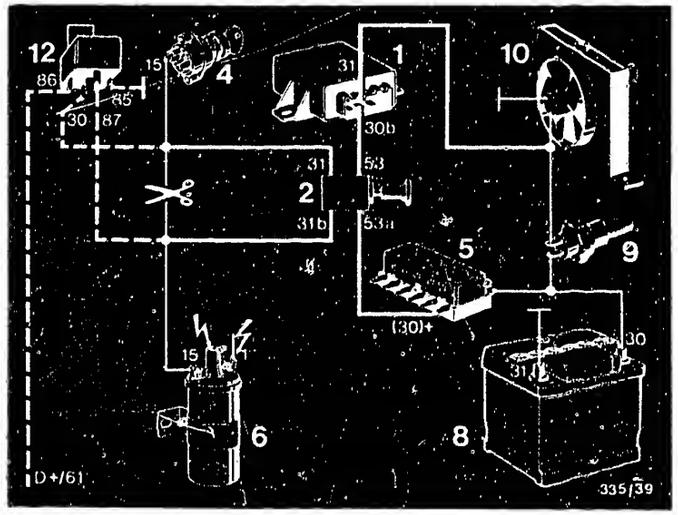
Top diagram:

Prevention of alarm through startup of radiator fan (+switched) with vehicle parked.
Alarm switch 2 switches "negative" (-) to alarm relay 1.
To prevent unintentional switching off of the ignition while driving, an additional relay (12) can be installed.



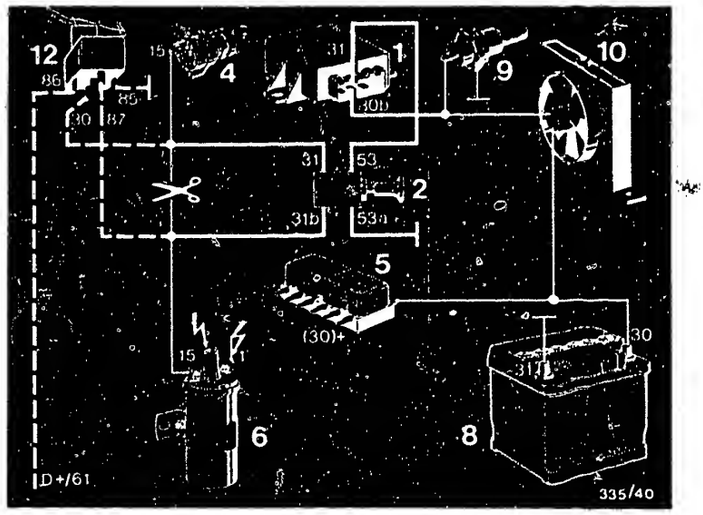
Center diagram:

Prevention of alarm through startup of radiator fan (+switched) with vehicle parked.
Alarm switch 2 switches "positive" (+) to alarm relay 1.
To prevent unintentional switching off of the ignition while driving, an additional relay (12) can be installed.



Bottom diagram:

Prevention of alarm through startup of radiator fan (-switched) with vehicle parked.
Alarm switch 2 switches "negative" (-) to alarm relay 1.
To prevent unintentional switching off of the ignition while driving, an additional relay (12) can be installed.



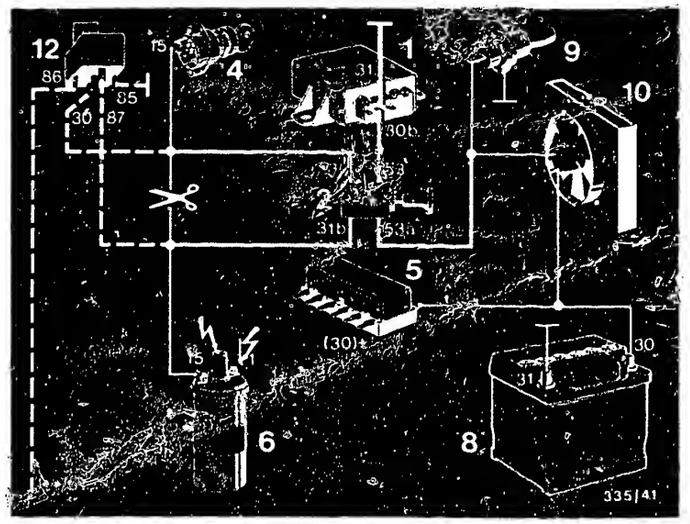
Key to diagrams:

1 = Alarm relay	5 = Fuse box (8 A fuse)	8 = Battery	12 = Relay (12 V, change-over contact, here as normally-open contact)
2 = Alarm switch		9 = Thermo-switch	
4 = Ignition/starting switch	6 = Ignition coil	10 = Radiator fan	

False alarm with Car Alarm I after stopping the engine when hot, alarm switch on (continued)

Top diagram:

Prevention of alarm through startup of radiator fan (-switched) with vehicle parked. Alarm switch switches "positive" (+) to alarm relay 1. To prevent unintentional switching off of the ignition while driving, an additional relay (12) can be installed.



5.5.3 False alarm with Car Alarm I after switching on of auxiliary heater, alarm switch on

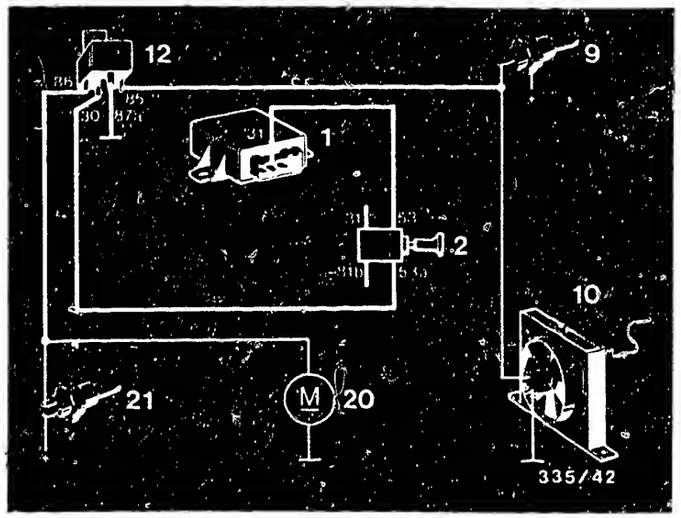
Alarm sounds immediately after switching on of auxiliary heater (through timeswitch)	→ Incorrect wiring when installing system. Caution: + and -switched fan motors. Connect according to circuit diagram.

Center diagram:

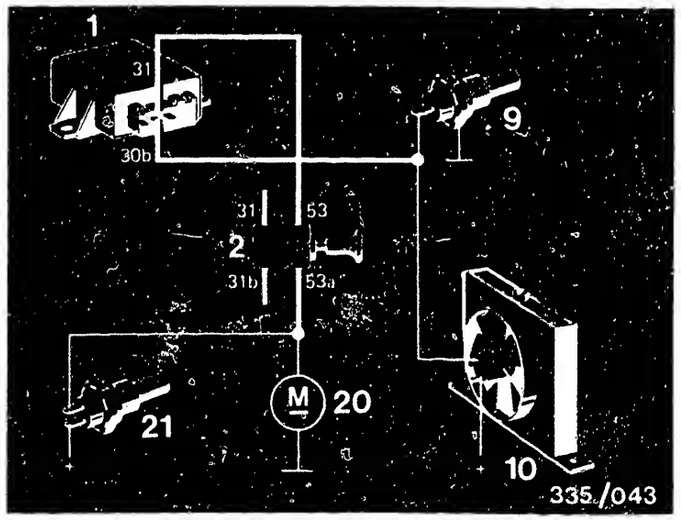
Prevention of alarm by relay (12) through startup of heater blower motor (20) (+switched) in conjunction with auxiliary heater with vehicle parked.

Bottom diagram:

Prevention of alarm by relay (12) through startup of heater blower motor (20) (-switched) in conjunction with auxiliary heater with vehicle parked.



1 = Alarm relay
2 = Alarm switch
4 = Ignition/starting switch
5 = Fuse box (8 A fuse)
6 = Ignition coil
8 = Battery
9 = Thermo-switch
10 = Radiator fan
12 = Relay (12 V, change-over contact, here as normally-open contact)
20 = Heater blower motor
21 = Thermostat switch for heater blower motor



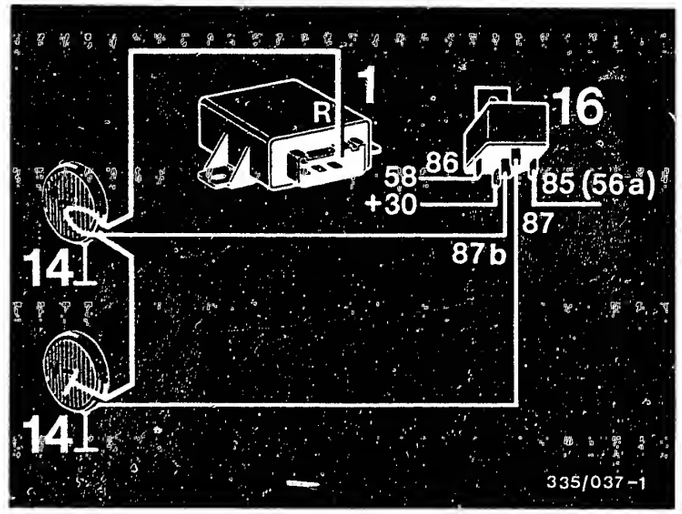
5.5.4 False alarm with Car Alarm I after the system has already worked correctly for some time, alarm switch on

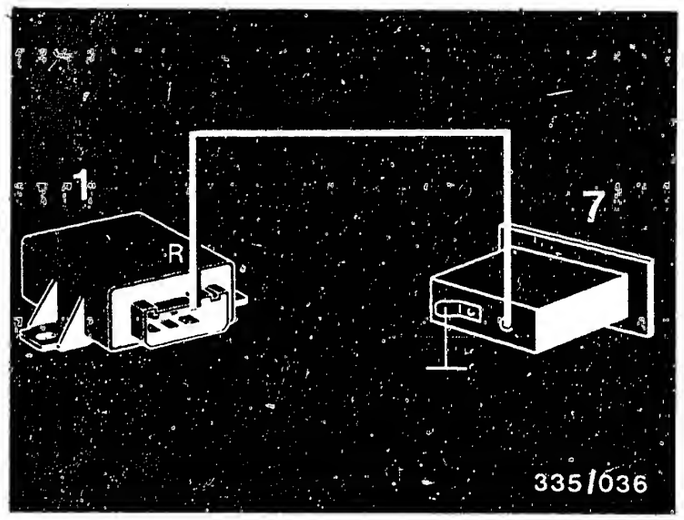
Alarm sounds immediately without detectable switching on of an electrical device	→ Loose contact in ground lead of an electrical device routed via terminal R of alarm relay (see diagrams for examples). Short circuit/short circuit to ground between leads (e.g. under foot mats at leadthroughs through metal walls etc.) the effects of which are not immediately noticeable. Check leads.

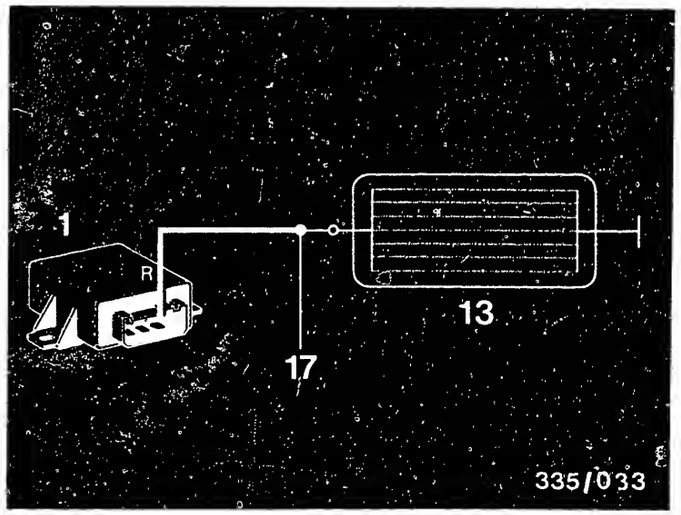
False alarm without arming is not possible (for this, terminals 53 and 53a in the alarm switch and terminals A and B in the alarm relay would have to be short-circuited simultaneously; in this case, there would be a continuous sounding of the alarm).

Key to diagrams

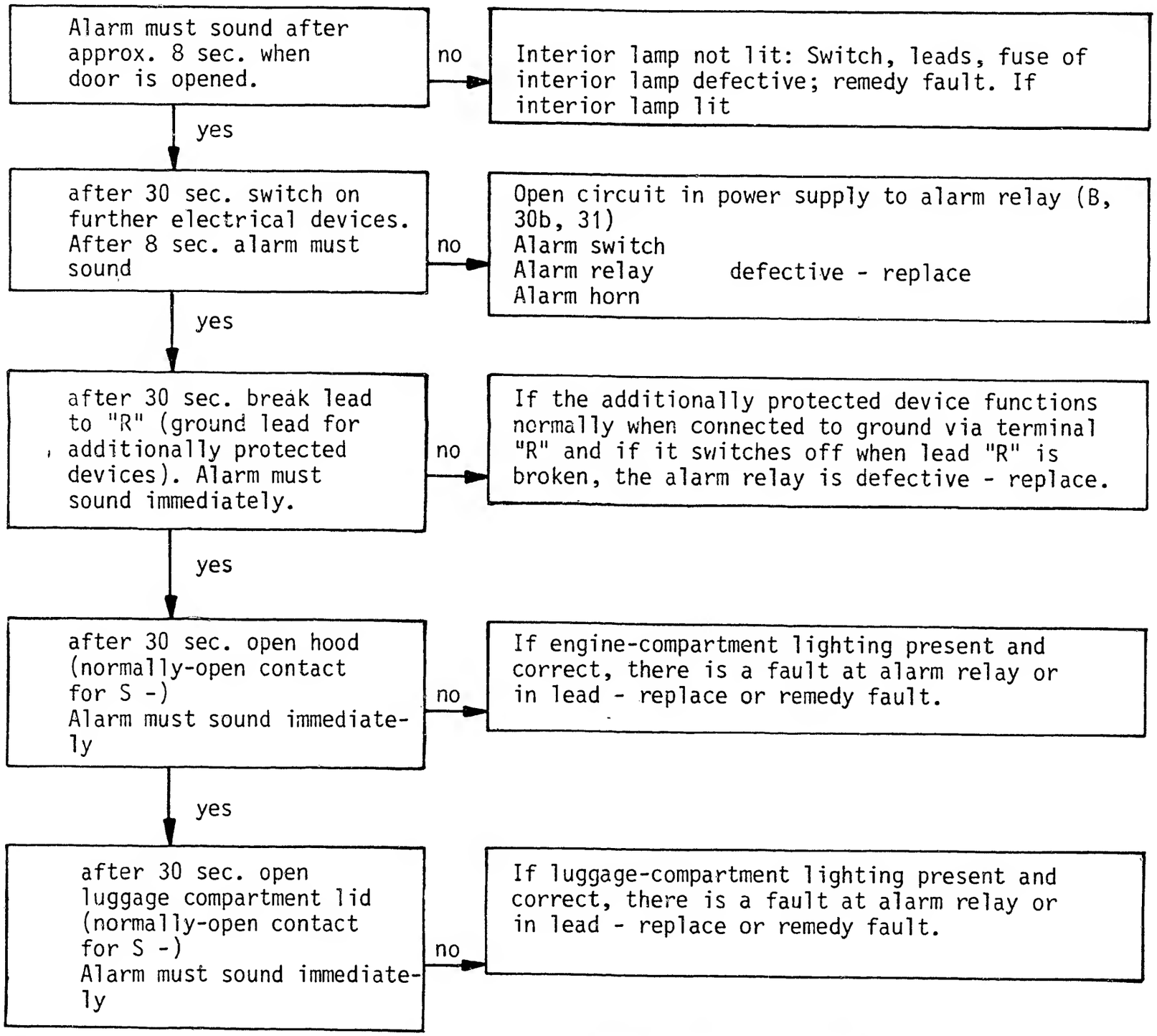
1 = Alarm relay
7 = Radio
13 = heated rear window
14 = Auxiliary lamp
16 = Auxiliary relay (twin normally-open contact)
17 = To switch/relay for heated rear window







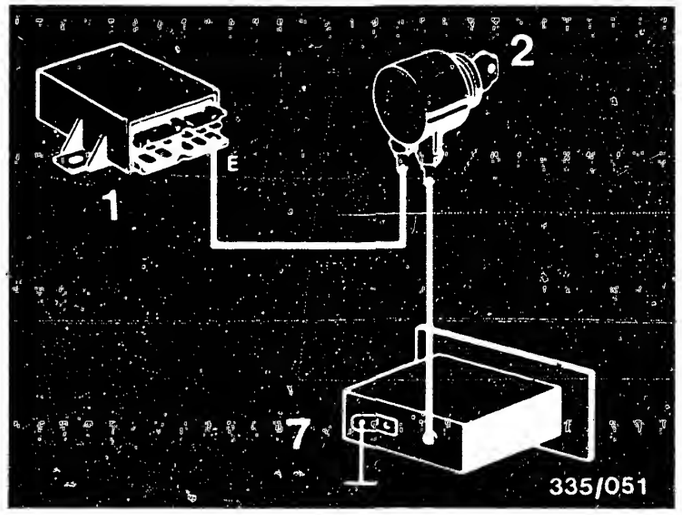
5.5.5 No alarm with Car Alarm I - Alarm switch on



5.6 Car Alarm II

5.6.1 False alarm with Car Alarm II - Alarm switch on

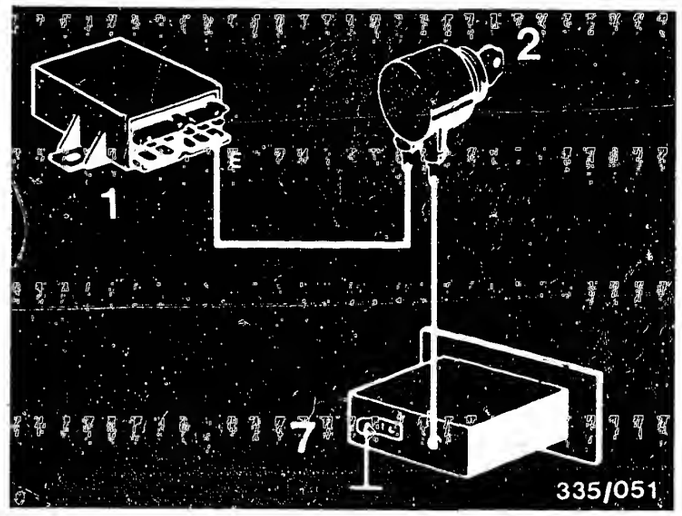
Alarm without detectable switching on of an electrical device	Alarm switch defective: Internal resistance 0 Ω or connector dropped off alarm switch. Short circuit or moisture short circuit in alarm switch, due to heavy rain or water jet in car wash etc. Open circuit in ground connection of alarm switch due to: e.g. poor contact on vehicle body/engine, or at electrical devices (e.g. radio) whose ground lead is routed via alarm switch for protection. Remedy fault.
Alarm when detectable switching on of an electrical device	Short circuit or short circuit to ground in switch or lead to the energized device. Remedy fault.



1 = Alarm relay
2 = Alarm switch
7 = Radio

5.6.2 False alarm with Car Alarm II - Alarm switch off

Alarm with vehicle stopped or while driving	Alarm switch defective: Internal resistance 0 Ω or connector dropped off alarm switch. Short circuit or moisture short circuit in alarm switch, due to heavy rain or water jet in car wash etc. Open circuit in ground connection of alarm switch due to: e.g. poor contact on vehicle body/engine, or at electrical devices (e.g. radio) whose ground lead is routed via alarm switch for protection. Remedy fault.
Alarm horn sounds continuously	Short circuit in alarm relay between terminals A and B - replace.



1 = Alarm relay
2 = Alarm switch
7 = Radio

5.6.3 No triggering of alarm with Car Alarm II - Alarm switch on

One after the other, open all doors, luggage-compartment lid and engine hood. Alarm must sound each time.
(Each time after alarm starts, switch off alarm switch and switch on again immediately. Then open next door, luggage-compartment lid or hood).

no → Corresponding lamp not lit:
Switch, lead or fuse defective. Caution!
Switch + or - switched?
Remedy fault.

Lamp lit:
Open circuit in lead to connections of alarm relay S-, T+ or T- (connector loose etc.) - remedy fault.
Alarm horn defective
Alarm relay defective - replace

yes ↓

Switch on ignition.
Alarm must sound immediately

no → Open circuit in lead to terminal S+ (on alarm relay) - repair;
alarm relay defective - replace

yes ↓

Disconnect plug from alarm switch
Alarm must sound immediately

no → Alarm relay defective - replace

yes ↓

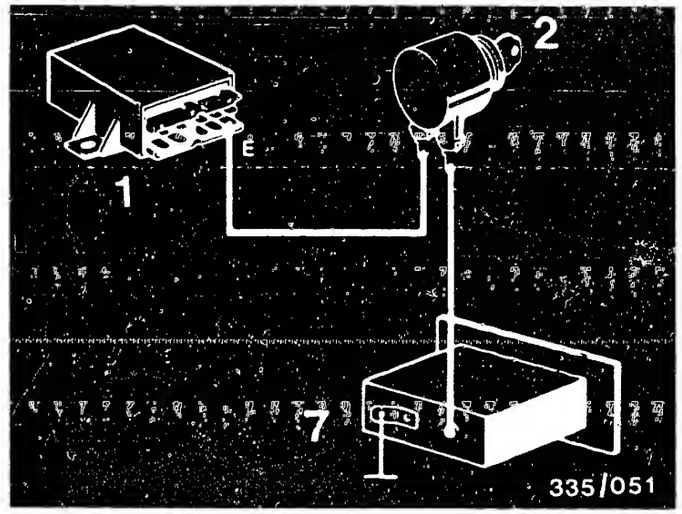
Loosen ground lead from radio.
Alarm must sound immediately.

no → Check whether radio ground lead is routed via alarm switch to terminal "E" of alarm relay (see diagram).
Alarm relay defective - replace

yes ↓

Disconnect lead "E" from alarm relay.
Alarm must sound immediately.

no → Alarm relay defective - replace



1 = Alarm relay
2 = Alarm switch
7 = Radio

5.7 Car Alarm Plus 3 (wheel protection)

5.7.1 No alarm with Car Alarm Plus 3 (wheel protection) - Alarm switch on

Conditions: Car Alarm I or II O.K. (check as described previously; to do this, disconnect 6-pin plug from trigger box (evaluation electronics).

Wait for system to adapt (approx. 50 seconds).
Press down or raise up angle sensor by approx. 5 mm on one side of the 3-point mounting, and hold in this position.
Alarm must sound after 1...2 seconds.

no

Check plug-in connections.

Try connecting a new angle sensor.

After approx. 50 seconds (adaptation time) tilt new angle sensor slightly to the side:
Alarm must sound.

yes

Press down or raise up angle sensor at 90° to the previous direction; alarm must sound after 1...2 seconds.

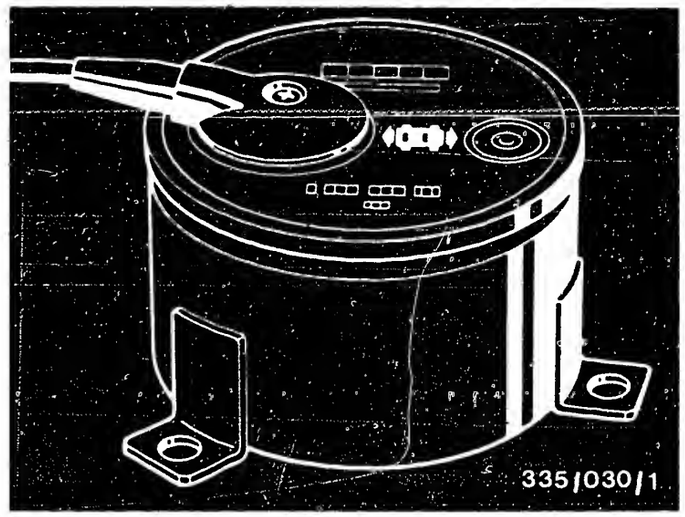
no

Exchange angle sensor again.

Try connecting a different trigger box (evaluation electronics).

After approx. 50 seconds, tilt angle sensor to the side:

Alarm must sound.



Angle sensor

5.8 Car Alarm Plus 4 (passenger-compartment protection)

5.8.1 No alarm with Car Alarm Plus 4 (passenger-compartment protection), alarm switch on

Test conditions: Car Alarm I or II O.K.

Switch on Car Alarm I. Wait approx. 60 sec. until system is armed.

With Car Alarm II system is armed immediately.

Disturb 3-dimensional ultrasonic field by movement in passenger compartment.

With Car Alarm I, alarm must sound after a delay of approx. 5 sec.; with Car Alarm II, alarm must sound immediately.

no

Check plug-in connections at alarm relay and evaluation electronics.

Re-adjust response sensitivity at evaluation electronics.

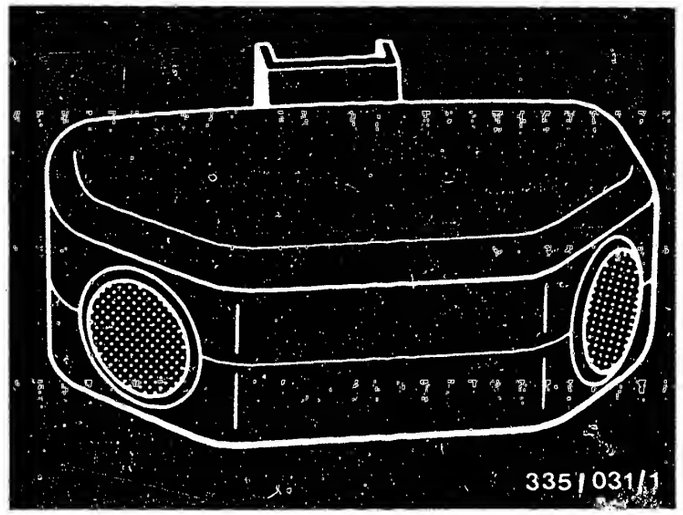
Check alarm system as described previously.

System O.K.?

no

One after the other, replace evaluation electronics and ultrasonic detector.

Each time, repeat test.



Ultrasonic movement detector

Testing of Car Alarm I, II, Plus 3, Plus 4 completed.

5.9 Two-wheeled vehicle alarm

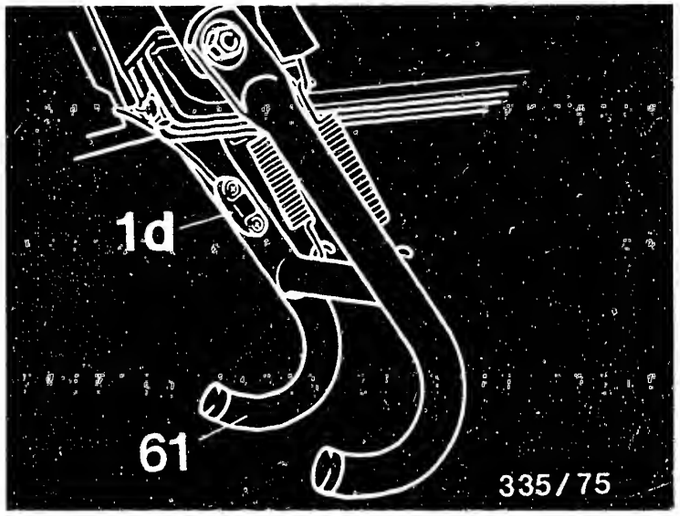
5.9.1 No alarm with two-wheeled vehicle alarm. Alarm switch on

Switch on ignition. Alarm must sound immediately.
- no → Check lead from ignition lock to alarm relay. Replace defective lead.
- yes ↓

Hinge up stand. Alarm must sound immediately.
- no → Check lead from alarm relay to sensor for open circuit. Ground connection from sensor to battery negative. Ground approx. 0 Ω. Otherwise replace sensor.
- yes ↓

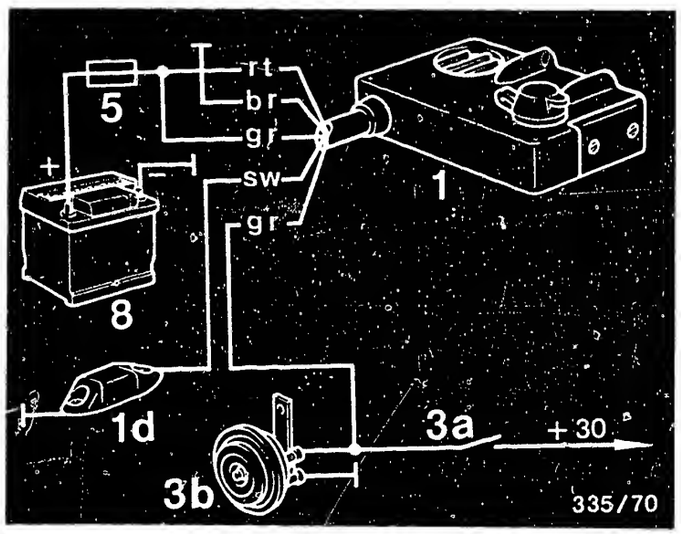
Disconnect positive lead (red) from alarm relay on vehicle battery. Alarm must sound immediately through built-in horn.
- no → Replace alarm relay. Repeat functional test.
- yes ↓

Continued on E17/E18



1d = Sensor
61 = Motorcycle stand

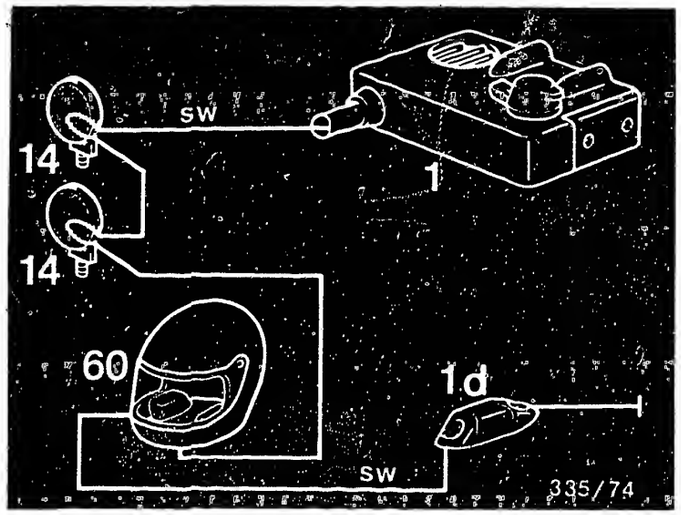
br=brown
ge=yellow
gn=green
1 =Alarm relay
gr=gray
rt=red
sw=black



If accessories are protected, such as helmet, saddle bag, auxiliary lamp etc., disconnect black lead from alarm relay. Alarm must sound immediately.

no →

Alarm relay defective.
After replacing alarm relay, carry out functional test.

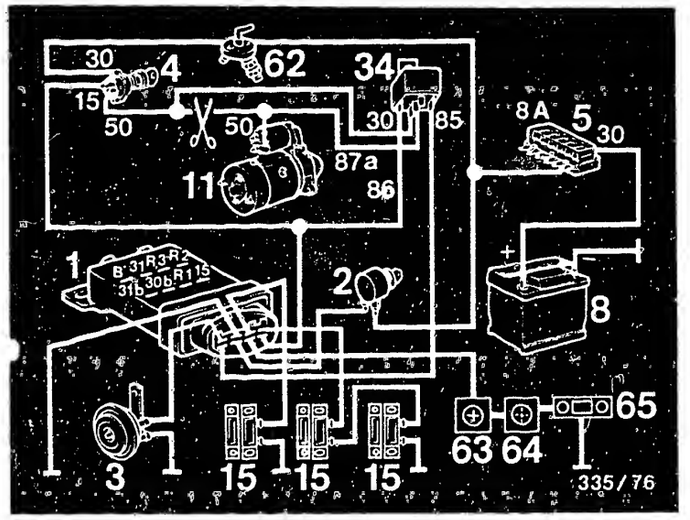


sw = black
1 = Alarm relay
1d = Sensor
14 = Auxiliary lamp
60 = Helmet

5.10 Boat Alarm

5.10.1 False alarm with Boat Alarm immediately after installation when system is primed

Immediate alarm upon opening cabin door	Incorrect connection during installation of system, or defective alarm relay. Cabin-door contact may not be connected to term. R1 or R2. Alter connection.
Alarm delayed by a few seconds after opening engine or storage compartment hatch	Incorrect connection during installation of system. The contact switches for the engine and storage compartments are not connected to R 1 or R 2. Correct connections. Use original contact switches.



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition and starting switch
5 = Fuse box
(8A fuse)
8 = On-board battery
11 = Starting motor
15 = Contact switches e.g. at cabin doors, engine and storage compartment hatches, etc.
24 = Start-interrupt relay (12 V change-over contact break-before-make, here normally-closed contact)
62 = Battery master switch
63 = Boat compass
64 = Depth sounder
65 = Radio

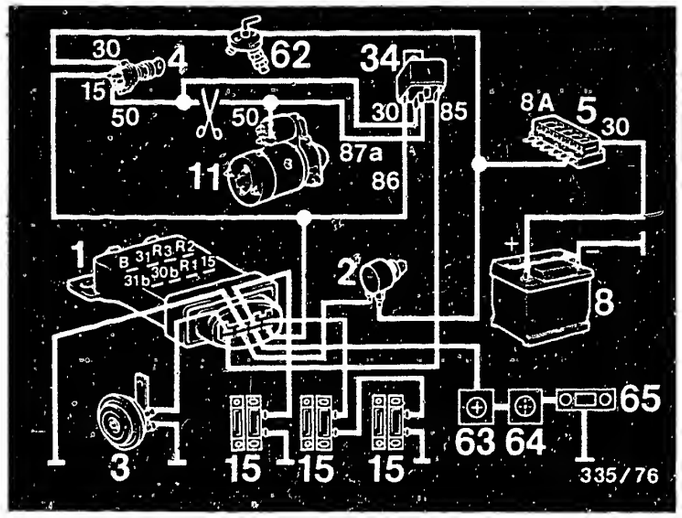
5.10.2 False alarm with Boat Alarm after system has been operating satisfactorily for a time, alarm switched on

Immediate alarm without discernible opening of cabin or engine/storage compartment hatches.

→ Loose contact in accessory ground cable leading to term. R1 of the alarm relay, or in the lead from the contact switch at the engine/storage compartment to term. R2 on the alarm relay.

Check leads for short circuit or ground connection between the leads (e.g. where passing through metal walls etc.).

False alarm without priming is impossible (before this could happen, there would have to be a short circuit in the alarm switch and at the same time a connection between terminals B and 30b of the alarm relay; this would cause a continuous tone).



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition and starting switch
5 = Fuse box
(8A fuse)
8 = On-board battery
11 = Starting motor
15 = Contact switches e.g. at cabin doors, engine and storage compartment hatches, etc.
24 = Start-interrupt relay (12 V change-over contact break-before-make, here normally-closed contact)
62 = Battery master switch
63 = Boat compass
64 = Depth sounder
65 = Radio

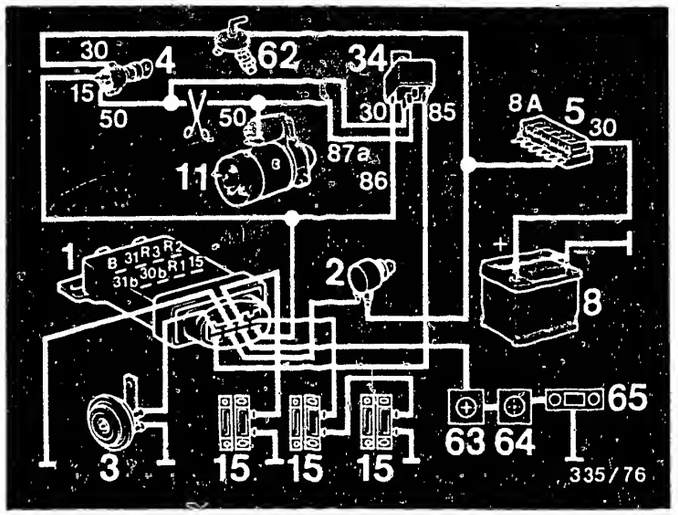
5.10.3 No alarm with Boat Alarm – alarm switch on

Upon opening cabin door, alarm should sound after approx. 5 sec.
- no → Defective contact switches, leads, fuse; rectify defects. If contact switches OK.
- yes ↓

After 30 sec. open other doors (engine compartment, storage compartment etc.). Alarm should sound immediately.
- no → If alarm sounds once, defect can only be in the alarm relay or in the leads to term. R 1/R 2.
- yes ↓

After 30 sec. make open contact in lead to term. R 1 (ground lead for protected accessories). Alarm should follow immediately.
- no → If the protected accessories function normally when connected via terminal "R 1" to ground and switch off again when lead "R 1" is interrupted, the alarm relay is defective and must be replaced.
- yes ↓

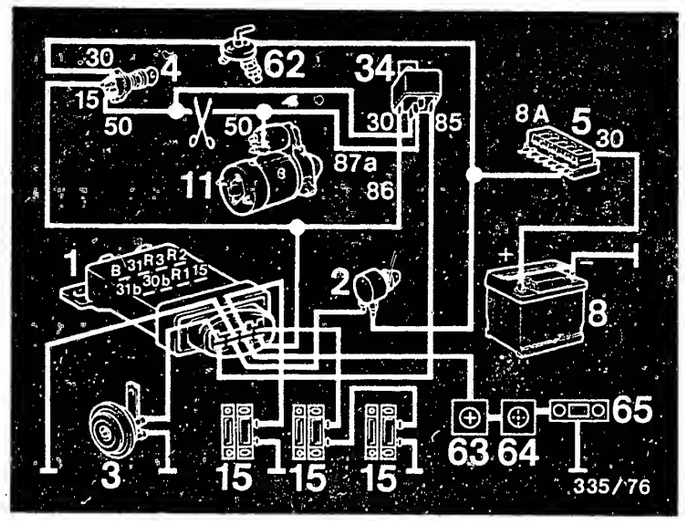
After 30 sec. switch on ignition. Starting motor must not function. Alarm should sound immediately.
- no → Start-interrupt relay defective. Open circuit in lead to terminal 50. Rectify faults, replace defective start-interrupt relay or eliminate open circuits in lead.



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition and starting switch
5 = Fuse box (8A fuse)
8 = On-board battery
11 = Starting motor
15 = Contact switches e.g. at cabin doors, engine and storage compartment hatches, etc.
24 = Start-interrupt relay (12 V change-over contact break-before-make, here normally-closed contact)
62 = Battery master switch
63 = Boat compass
64 = Depth sounder
65 = Radio

5.10.4 False alarm with Boat Alarm, alarm switched off

Alarm when boat is turned off or underway	Alarm switch defective: Internal resistance 0 Ω. Switch has closing contact, with simulataneous short circuit or short caused by moisture in alarm relay.
Alarm horn produces continuous tone.	Alarm relay has short circuit between terms. 31b and B; replace alarm relay.



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition and starting switch
5 = Fuse box
(8A fuse)
8 = On-board battery
11 = Starting motor
15 = Contact switches e.g. at cabin doors, engine and storage compartment hatches, etc.
24 = Start-interrupt relay (12 V change-over contact break-before-make, here normally-closed contact)
62 = Battery master switch
63 = Boat compass
64 = Depth sounder
65 = Radio

5.10.5 False alarm with Boat Alarm-Alarm switched on

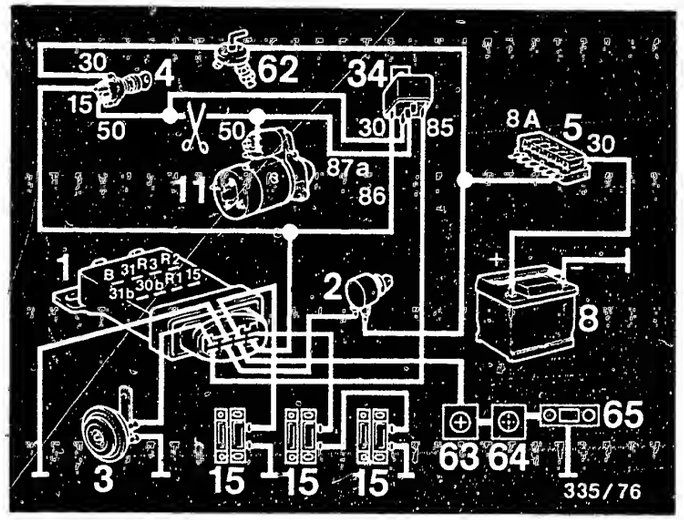
Alarm without discernible opening of a hatch or removal of an accessory.

→ Alarm switch defective:
Internal resistance 0 Ω or plug has fallen out of alarm switch.

Contact switch defective, open Reed contacts.

Defective contact switch at terminals R1, R2, or R3

Rectify faults.



1 = Alarm relay
2 = Alarm switch
3 = Alarm horn
4 = Ignition and starting switch
5 = Fuse box
(8A fuse)
8 = On-board battery
11 = Starting motor
15 = Contact switches e.g. at cabin doors, engine and storage compartment hatches, etc.
24 = Start-interrupt relay (12 V change-over contact break-before-make, here normally-closed contact)
62 = Battery master switch
63 = Boat compass
64 = Depth sounder
65 = Radio

After-sales Service

Technical Bulletin

CAR ALARM PLUS 4 (ULTRASONIC)

0 986 335 003

VDT-I-335/112 En

7. 1983

General information

Operating principle:

Ultrasound is mechanical vibrations above the frequency range of the human ear. The sensor generates ultrasonic waves which are subject to lobar propagation and thus scan the interior of the vehicle, building up an ultrasonic field. As soon as the ultrasonic field undergoes a change this is evaluated by the receiver and the alarm is triggered. Ultrasonic waves do not pass through walls or glass and are thus confined to the interior.

Application:

Optimum effect is achieved in passenger car interiors. In larger spaces (station wagon, motor home) there is such a drop in sensitivity that complete protection of the interior is no longer guaranteed. It is not possible to equip a larger space with two sensors in order to improve sensitivity. The sensors interfere with each other and trigger a false alarm. Two separate compartments can each be equipped with an ultrasonic system by using a basic system (car alarm 1 or car alarm 2).

Installation:

Smooth, hard surfaces such as windows, doors, leather covers reflect ultrasonic waves. The sensitivity is not thereby adversely affected.

Fabrics, plush, velvet, curtains absorb ultrasonic waves. This reduces the sensitivity.

Temperature fluctuations/direct sunlight do not lead to a false alarm.

BOSCH Geschäftsbereich KH Kundendienst Kfz-Ausrüstung

Optimum effect of the sensor is obtained if the installation location is as high as possible so that the ultrasonic waves can radiate freely.

After the system has been installed the sensitivity can be set at the alarm relay of the Plus 4 system.

See the installation instructions for further details.

Current consumption:

Car alarm Plus 4 in conjunction with car alarm 1 or 2: approx. 21 mA.

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Published by: After-Sales Service Department for Training and Technology (KH/VSK). Press date: 1.1986

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